

2012

## The Effect of Learning Styles and E-Learning Tools on the Training of ICT to Digital Immigrants in Life Long Learning

Stephen Horan  
*Technological University Dublin*

Follow this and additional works at: <https://arrow.tudublin.ie/scschcomdis>

 Part of the [Computer Engineering Commons](#)

---

### Recommended Citation

Horan, S. : The Effect of Learning Styles and E-Learning Tools on the Training of ICT to Digital Immigrants in Life Long Learning. Masters Dissertation. Technological University Dublin, 2013.

This Dissertation is brought to you for free and open access by the School of Computing at ARROW@TU Dublin. It has been accepted for inclusion in Dissertations by an authorized administrator of ARROW@TU Dublin. For more information, please contact [yvonne.desmond@tudublin.ie](mailto:yvonne.desmond@tudublin.ie), [arrow.admin@tudublin.ie](mailto:arrow.admin@tudublin.ie), [brian.widdis@tudublin.ie](mailto:brian.widdis@tudublin.ie).



This work is licensed under a [Creative Commons Attribution-Noncommercial-Share Alike 3.0 License](#)

# **The Effect of Learning Styles and E-Learning Tools on the training of ICT to Digital Immigrants in Life Long Learning**

**Stephen Horan**

A dissertation submitted in partial fulfilment of the requirements of  
Dublin Institute of Technology for the degree of  
M.Sc. in Computing (Information Technology)

**July 2012**

I certify that this dissertation which I now submit for examination for the award of MSc in Computing (Information Technology), is entirely my own work and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

This dissertation was prepared according to the regulations for postgraduate study of the Dublin Institute of Technology and has not been submitted in whole or part for an award in any other Institute or University.

The work reported on in this dissertation conforms to the principles and requirements of the Institute's guidelines for ethics in research.

***Signed:*** \_\_\_\_\_

***Date:***                      ***16 July 2012***

## **ABSTRACT**

The diversity of learners in the classroom has expanded significantly in the past twenty years, in a modern classroom it is unsurprising to see learners for whom English is not their first language, learners with specific learning difficulties, mature learners, learners attempting to return to work, etc., so much so that the 'typical' learner has become extinct.

This research will look at the use of Information Communication Technology in Education by undertaking an investigation of how the use of ICT can aid learners, both digital natives and digital immigrants. The project will use learning styles at the core of an e-Learning tool developed as a model of diversity. A great deal of research has been carried out in this area with regard to learning styles and how interaction with ICT can facilitate learning. In this work a range of students will be introduced to an e-Learning tool to aid in their learning of a specific topic, in this case a small element of spreadsheet design. To evaluate the success of the e-Learning tool the learners will undertake a questionnaire.

**Key words:** Digital Native, Digital Immigrant, Learning Styles, VARK, E-learning, Adult education, Life Long Learning

## **ACKNOWLEDGEMENTS**

I would like to express my sincere thanks to .....

Deirdre Lawless – My supervisor for all her help and support in writing this document over the last few months. Her dedication and competence and insights into the many varying aspects of this project were inspirational. I would like to especial thank Deirdre for her understanding and direction all throughout this process. Without her assistance and direction this dissertation would not have been possible

Damian Gordon – For his support and insight and the world of learning. A truly dedicated and enthusiastic lecture, full of information and concepts.

To all the lecturers and staff for their support over the 2 years of my study in DIT, Kevin Street.

To all the VTOS and PLC Students - I would like to thank all the students for their understanding and patience with me over the last two years while I was a little preoccupied with this Master's course. In particular I would like to extend a big thank you to those students who took part in the experiment and for taking the time to complete my unending questionnaires.

Mary Campbell - VTOS Co-ordinator for her words of encouragement and her support especially at exam times and project deadlines.

Ruth Ermitia - ICT Tutor for taking part in the interview process and for always being at the end of a phone to offer support and common sense and psychological insights into the world of teaching. Also, for acting as a sounding board, for some of my slightly unusual ideas and rants.

Bernie McKenna - ICT Tutor who patiently took part in the interviews and for her support.

Risa Donohue – PLC Co-ordinator for her continued support in everything. Enjoy your retirement to the full, because you deserve it. You will be missed.

Kieran Healy – Deputy Principal Curragh – Words cannot describe the support that Kieran has been, not just over the duration of this course but for the many years that I have had the privilege to work alongside him.

All the other tutors in VTOS Athy and teachers in the Curragh Post Primary School, who for the last 2 years have offered their words of wisdom, and just those small words of encouragement along the way.

My Son David – for his patience these last 2 years, for the things we missed doing, because of classes, exams and assignments.

My Wife Michelle– for her support and love in everything that I do. For always being there, no matter what life threw at us. For the strength to carry on and the sacrifices that she has made to facilitate my journey to a Masters degree.

## Table of Contents

<b>TABLE OF FIGURES.....</b>	<b>viii</b>
<b>TABLE OF TABLES.....</b>	<b>ix</b>
<b>1 Introduction .....</b>	<b>10</b>
1.1 Introduction to Adult Education .....	10
1.2 Increase in Adult Education .....	12
1.3 Diversity of Learner .....	13
1.3.1 Irish Adult Education Background .....	15
1.3.2 VTOS the story so far.. .....	15
1.3.3 Post Leaving Cert (PLC) .....	16
1.3.4 What is FETAC?.....	17
1.3.5 Digital Native versus Digital Immigrant .....	17
1.4 Research problem.....	18
1.5 Intellectual challenge .....	19
1.6 Research objectives.....	20
1.7 Research methodology .....	20
1.8 Resources .....	21
1.9 Scope and limitations .....	21
1.10 Organisation of the dissertation .....	22
<b>2 Adult Education in Ireland.....</b>	<b>24</b>
2.1 Introduction.....	24
2.2 Government Policy .....	24
2.3 Award Structures in Further Education. ....	26
2.4 The Current State of Play.....	29
2.5 VTOS Athy .....	31
2.6 PLC .....	34
2.7 Conclusion .....	35
<b>3 Digital Immigrant Vs Digital Native.....</b>	<b>36</b>
3.1 Introduction.....	36
3.2 Background .....	36
3.3 The Flip Side.....	40
3.4 Is the Digital Immigrant versus Digital Native Paradigm enough? .....	41
3.5 Conclusion .....	42

<b>4</b>	<b>Learning Styles .....</b>	<b>43</b>
4.1	Introduction.....	43
4.2	Myers-Briggs Type Indicator Tests .....	43
4.3	Dunn and Dunn Model.....	44
4.4	Bernice McCarthy- 4MAT.....	45
4.5	VARK Learning Style.....	49
4.6	Conclusion .....	51
<b>5</b>	<b>E-learning tools.....</b>	<b>53</b>
5.1	E-Learning the Myths .....	53
5.2	E-Learning and teaching ICT.....	54
5.3	Conclusion .....	55
<b>6</b>	<b>Experimentation Design .....</b>	<b>57</b>
6.1	Introduction.....	57
6.2	Stage 1 – The VARK Questionnaire.....	57
6.3	Stage 2 - The Interview Questions.....	58
6.4	Stage 3 - Digital Immigrant/Digital Native Fluency Survey .....	60
6.5	Stage 4- The Design and use of the E-learning Tool .....	66
6.5.1	FETAC Requirements .....	67
6.5.2	The VARK Input .....	68
6.5.3	The Website Layout.....	70
6.6	Stage 5 - The Post Experiment Questionnaire .....	71
<b>7</b>	<b>Results and Evaluation .....</b>	<b>73</b>
7.1	The VARK Results .....	73
7.1.1	Respondent’s Profile.....	73
7.1.2	The VARK Matrix.....	74
7.2	The Interviews .....	78
7.3	The Digital Native/ Digital Immigrant Fluency Results.....	80
7.4	The results from the E-Learning survey. ....	94
7.5	Results Conclusions .....	104
7.5.1	VARK Results .....	104
7.5.2	Interview Conclusions .....	105
7.5.3	Digital Native/Digital Immigrant Survey Conclusions .....	106
7.5.4	If Statement Survey .....	107



<b>8</b>	<b>Conclusion.....</b>	<b>108</b>
8.1	Introduction.....	108
8.2	Research Definition & Research Overview .....	108
8.3	Contributions to the Body of Knowledge .....	109
8.4	Experimentation, Evaluation and Limitation .....	109
8.5	Future Work & Research .....	110
8.6	Conclusion .....	110
<b>9</b>	<b>Glossary of Terms .....</b>	<b>112</b>
9.1	Introduction.....	112
9.2	Bytes, Bits and Bobs - Glossary of Terms for Digital Immigrants.....	112
	<b>Bibliography.....</b>	<b>116</b>
<b>10</b>	<b>Appendices .....</b>	<b>121</b>
10.1	Appendix A - VARK Questionnaire.....	121
10.2	Appendix B - VARK Copyright .....	125
10.3	Appendix C Digital Native /Digital Immigrant Questionnaire.....	127
10.4	Appendix D The Experiment Post Questionnaire.....	132
10.5	Appendix E- Tutor 1’s Interview .....	139
10.6	Appendix F Tutor 2’s Interview .....	150

## TABLE OF FIGURES

Figure 1 Digital Immigrants vs Digital Natives .....	18
Figure 2 National Framework of Qualifications.....	27
Figure 3 Fluency in Digital Natives and Immigrants .....	42
Figure 4 Dunne and Dunne Model .....	45
Figure 5 McCarthy 4Mat System .....	45
Figure 6 Kolb's Learning Styles (ALAN CHAPMAN, 2005).....	47
Figure 7 The Gordon - Bull Metaodel of learning styles.....	48
Figure 8 Age Profile .....	73
Figure 9 Bi-modal Groupings.....	75
Figure 10 Single Preference Only.....	75
Figure 11 Single Modality by Gender .....	76
Figure 12 Multimodal by Gender .....	77
Figure 13 VARK - Digital Native vs Digital Immigrants .....	77
Figure 14 To Google or Not to Google .....	81
Figure 15 Cooking up a Storm DI/DN .....	82
Figure 16 Book Holidays Online.....	82
Figure 17 Email or Tweet DI/DN.....	83
Figure 18 Access to IT DI/DN .....	83
Figure 19 Internet Access DI/DN .....	84
Figure 20 Blog, Wiki and Social Networking Sites .....	85
Figure 21 No Connectivity - Nightmare or Normal, DI/DN .....	85
Figure 22 Text or English.....	86
Figure 23 Reminders! DI/DN .....	86
Figure 24 Technology Purchases DI/DN.....	87
Figure 25 Smartphone Purchases by Age.....	87
Figure 26 Game Play DI/DN .....	88
Figure 27 Learner 21, Female, Under 25 Age Group DI/DN Chart.....	89
Figure 28 Learner 19, Male, Under 25 Age Group DI/DN Chart .....	89
Figure 29 Learner 12, Female, 25-35 Age Group DI/DN Chart .....	90
Figure 30 Learner 17, Female 36-45 Age Group DI/DN Chart .....	90
Figure 31 Learner 1, Male, 36-45 Age Group DI/DN Chart .....	91
Figure 32 Learner 6, Female, 36-45 Age Group DI/DN Chart .....	91
Figure 33 Learner 2, Male, 56-65 Age Group DI/DN Chart .....	92
Figure 34 DI/DN Score for all respondents .....	92
Figure 35 Learners Use at Home and at Work .....	95
Figure 36 Alternative VARK Mode chosen .....	96
Figure 37 Experience of Non Main Mode.....	97
Figure 38 Learners Using their Preferred Mode in E-Learning .....	99
Figure 39 Preferred VARK Mode versus most helpful mode .....	101
Figure 40 Would you use e-learning tools in the future? .....	102

## **TABLE OF TABLES**

Table 1 FETAC Award Statistics 2006, 2011 (FETAC, 2007), (FETAC, 2012).....	27
Table 2 Award Recipients by Gender.....	28
Table 3 Age Distribution FETAC Awards 2006, 2011 .....	28
Table 4 Four Bipolar Scales of MBTI .....	44
Table 5 MTBI Example of Personality Type Combinations .....	44
Table 6 Comparison of Kolb's Styles and Honey and Mumford (CASSIDY, Simon, 2004) .....	48
Table 7 VARK Questionnaire Respondents Gender Profile .....	73
Table 8 VARK Questionnaire Respondents Age Profile .....	73
Table 9 VARK Questionnaire Respondents Courses .....	74
Table 10 Sample learner results.....	74
Table 11 Overall results from DI/DN Questionnaire .....	93
Table 12 The Responses for choosing Alternative Mode.....	96
Table 13 Reasons for Rating Non Main Mode .....	98
Table 14 Improvements for non Main Mode.....	98
Table 15 Reasons of Hindering Learning.....	99
Table 16 Experience Rating Reasons .....	99
Table 17 VARK Preferred Mode vs Learner Preferred Mode .....	100

# 1 INTRODUCTION

## *1.1 Introduction to Adult Education*

“Once you stop learning, you start dying”

(Albert Einstein)

Adult Education or Life Long Learning has been with us since the earliest times, although mainly it has been the preference of the well educated or the well to-do. In the not too distant past many people only received the most basic of educations with a select few obtaining a third level qualification.

“Lifelong learning can take place in a variety of environments, both inside and outside formal education and training systems. Lifelong learning implies investing in people and knowledge; promoting the acquisition of basic skills, including digital literacy and broadening opportunities for innovative, more flexible forms of learning.” (EUROSTAT, 2011)

However in recent years many more young people are attending colleges and universities and this has led to a wider acceptance and need for college. Mature learners are now looking at college or university as a possible option for them. Whenever there is a downturn in the economy or job losses, the focus on education or re-education intensifies. “Ever increasing numbers are now experiencing the pain of disadvantage through the change in their personal and social circumstances brought about by unemployment and burgeoning debt. The opportunity to return to adult and community education provides people with the means to seek alternative ways to fulfil their potential in a world and society which may appear to them to have lost clear definition.” (DUFFY, Marian (Preseident Aontas), 2011)

The need to retrain and re-educate the jobless has to climb the political ladder become an issue of grave concern. Many people grasp the opportunity to retrain and so the numbers seeking Further Education increase. In the last 20 years Adult Education, which involved training people at the basic level has transformed itself into Life Long

Learning offering courses from basic education to degrees and beyond. The Ireland of today for many people is not the working world they joined after leaving school; it has advanced and morphed into a knowledge economy. Work has changed, gone are the many manual jobs of the past, now it is a world of Information Communication Technology and for most people that means that there is a need for retraining.

The use of ICT continues to grown worldwide but Ireland has ranked 29<sup>th</sup> in the world when it comes to using technology to boost growth as outlined in a World Economic Forum (WEF) Report (WORLD ECONOMIC FORUM(WEF), 2011). Mary Hanafin the Minister for Education and Science stated in 2007 “ The development of strong ICT literacy in all our children will be an essential life skill for them as they look to participate in the opportunities of the global knowledge society” and the exact same is applicable to learners of all ages.

The Irish Business and Employers Confederation (IBEC) in their report on Industry in Ireland states regarding the position of ICT in Ireland (IBEC, 2010)

- 9 out of the top 10 ICT companies in the world
- all of the top 5 software companies
- 4 of the top 5 semiconductor firm
- 5,400 ICT enterprises
- 25% of Ireland’s total turnover
- €50 billion of Ireland’s exports in 2009
- 75,000 people employed in ICT companies

With the growth of ICT in Ireland and the transformation of Ireland into a knowledge economy it is imperative that the workforce of Ireland, both young and old, is ready to embrace this change. IBEC in their policy recommendations to government state that there is an urgent need for extensive improvement in our education system at all levels and that the teaching of ICT in education is still mainly focused on providing ICT aids to teachers who are still using “traditional teaching methods”. IBEC also call for “a more ambitious approach” which “could dramatically improve educational outcomes” This would be achieved “by enabling a more student-centric, personalised learning experience” for the learners. (IBEC, 2011)

With all these calls for increased ICT training and a change in the Status Quo as far as teaching is concerned, it is very important that other avenues of education, not just traditional teaching methods are explored.

In this project the use of e-learning tools to train older and younger learners in a manner consistent with their favoured approach to learning will be explored. The project will develop an e-learning tool which will allow learners to examine a ICT problem in a number of different styles and to ascertain which is the most beneficial to their learning.

## ***1.2 Increase in Adult Education***

In a recent report by Eurostat<sup>1</sup> researched the top reasons for participation in non formal education and training (EUROSTAT, 2007). Some of the reasons are listed below.

- To get knowledge/skills relating to an interesting subject
- To get knowledge/skills useful for everyday life.
- To increase possibility of getting a job/ changing job
- Do job better/improve career prospects
- Obtain qualification
- To be less likely to lose job

The findings of the National Skills Strategy report carried out on the labour force show an increase in the percentage of those with Higher Education Qualifications (NFQ Levels 6-10) had increased from 33% in 2005 to 39% in 2009. This increase didn't cross over to the Secondary sector (NFQ Levels 4 + 5) which remained at 40% between 2005 and 2009. The percentage decreased for those who highest qualification was Junior Certificate (NFQ levels 1-3) from 27% to 21%, which is still a substantial distance from the 2020 target of 7%. (DEPT OF JOBS, ENTERPRISE AND INNOVATION, 2010)

---

<sup>1</sup> Eurostat is the statistical office of the European Union  
[http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Glossary:Eurostat](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Eurostat)

In November 2002 the Copenhagen Declaration launched the cross European policy for cooperation in the area of Vocational Education and Training (VET). This was replaced in 2010 by the (EUROPEAN MINISTERS FOR VOCATIONAL EDUCATION AND TRAINING, 2010). This communiqué sets out a global vision of Vocational Education and Training in 2020 and the strategic objectives for the period 2011 – 2020. This document paves the way forward for vocational training in Europe.

### ***1.3 Diversity of Learner***

The diversity of learners in the classroom has expanded significantly in the past twenty years, in a modern classroom it is unsurprising to see learners for whom English is not their first language, learners with specific learning difficulties, mature learners, learners attempting to return to work, etc., so much so that the 'typical' learner has become extinct.

In the realm of Adult Education the divide is even more exacerbated, because for some they are also returning to education for the first time in a very long time, some having completed college, while others may not have even completed the Inter-cert (Junior Cert).

This research will look at the use of Information Communication Technology in Education by undertaking an investigation of how the use of ICT can aid learners, both young and old. Marc Prensky coined the terms digital native to represent those young people born since the 1980s and immersed in new technology and those of older generations not as immersed in technology were referred to as digital immigrants. This is just one of the issues that a tutor in a class may have to deal with. This issue become more pronounced when the subject has its basis in ICT.

So how does a tutor in today's class deal with the diversity before them?

Every learner is different and every learner learns in a different way, so if it were possible to find out how each person learns then it would allow a tutor to present a class in a more structured way to facilitate the different ways in which learning is achieved. Equally if a learner know and understands how they best learn, then the subject lesson can be a more rewarding experience.

The project will use learning styles at the core of an e-Learning tool developed as a model of diversity.

A great deal of research has been carried out in this area with regard to learning styles and how interaction with ICT can facilitate learning. In this work a range of learners will be introduced to an e-Learning tool to aid in their learning of a specific topic, in this case a small element of spreadsheet design.

The learners will also be provided with a VARK questionnaire to ascertain their preferred learning mode.

To evaluate the success of the e-Learning tool I will provide learners with a pre e-learning tool questionnaire and a post e-learning tool questionnaire to ascertain the benefits or difficulties with using an e-learning tool. Two of the other tutors will also be interviewed to accumulate their experience into the project.

As the modern economy shrinks and jobless numbers increase the need and necessity for retaining is on the increase, and this is highlighted by the number of men now attending courses as opposed to 5 years ago.



With retraining programmes comes the added issues of age difference, education difference and IT experience. Also among a large number of learners there is also the significant issue of low self esteem brought about by lack of work and fear of the future.

### 1.3.1 Irish Adult Education Background

Lifelong learning has only recently permeated its way into educational policy in Ireland; as a result there is a distinct lack of literature with regard to lifelong learning and further adult education in Ireland.

The government have published a number of Green and White papers primarily dealing with Adult Education, but there is still a lot of room for improvement.

### 1.3.2 VTOS the story so far..

I have been fortunate enough to have worked in VTOS Athy since 1991 and in the PLC in the Curragh Post Primary School since 2002. The project is being undertaken with one class in VTOS and with one class in the PLC. Both of the classes are studying for a FETAC Award in Business.

VTOS as an organisation came into being in 1991 and is a second chance education and training programme, which provides courses of up to two years duration for unemployed people.

To be eligible for the scheme,

- a person must be over 21 years of age,
- unemployed,
- and at least six months in receipt of specific social welfare payments.

Courses are provided free of charge, and meal and travel allowances are available. Courses are full-time and can last up to two years, with 30 hours attendance per week. The scheme has proved to be a great success in opening up learning and progression opportunities for people who have been marginalised by unemployment.

Participants on VTOS can pursue subjects in the following areas

- Junior Cert
- Leaving Certificate programmes or
- modules or awards certified by the Further Education and Training Awards Council at Level 3,
- Level 4 awards certified by the Further Education and Training Awards Council
- Level 5. awards certified by the Further Education and Training Awards Council

VTOS is funded by the ESF, and administered by the Department of Education and Science (DES) through the Vocational Educational Committees throughout Ireland. There are currently 33 VECs (Vocational Education Committees) all over Ireland but these are being rationalised down to 16 in the forthcoming years.

#### 1.3.3 Post Leaving Cert (PLC)

PLC courses offer full time courses, being of 1 year duration. They are mainly offered at young adults having just completed the Senior Cycle but are open to Adults of any age with no formal qualifications. These courses provide general education, vocational training and work experience while offering FETAC level 5 and level 6 Awards. In Ireland over 90% of all PLC enrolments are in the VEC sector.

Many learners see PLC as a way of enhancing their employment prospects or as an alternative route to further education. The Higher Education Links Scheme (HELS) can provide links to College places and since 2005 the Institutes of Technology and some other higher education institutions have a scoring scheme for FETAC level 5 candidates. In the last 2 years the FETAC awards can be put onto the CAO (Central Application Office) college application forms.

#### 1.3.4 What is FETAC?

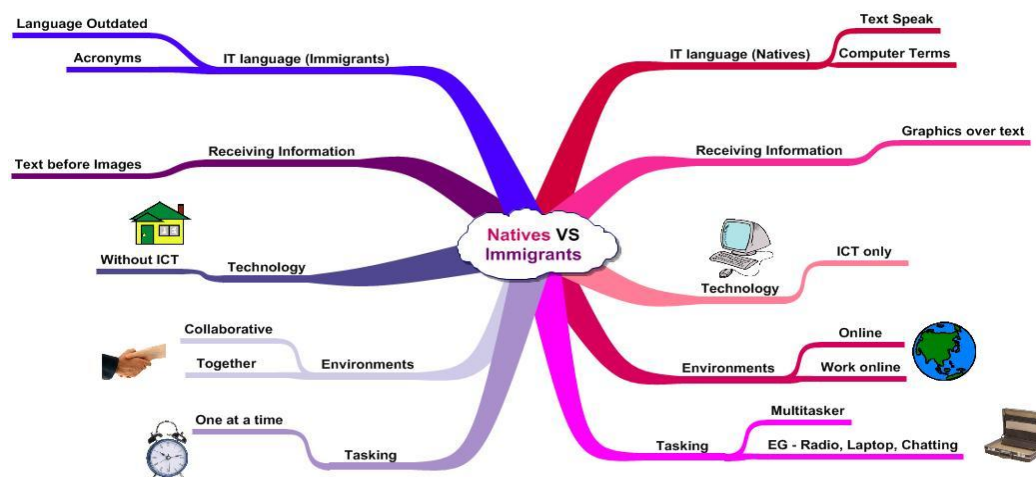
VTOS and the PLC course both offer FETAC courses in Business. FETAC is the Further Education and Training Awards Council and it provides nationally recognised awards. As the national awarding body for further education and training in Ireland, the Further Education and Training Awards Council (FETAC) gives people the opportunity to gain recognition for learning in education or training centres, in the work place and in the community. FETAC is responsible for awards that were previously covered by CERT, National Council for Vocational Awards (NCVA), FAS and Teagasc.

Since its establishment in 2001 there has been a substantial growth in the number of people achieving awards growing each year from 130,226 in 2006 to 180,690 last year 2011. (FETAC, 2012) (FETAC, 2007)

#### 1.3.5 Digital Native versus Digital Immigrant

The terms digital native and digital immigrant were first coined by Mark Prensky 2001. He noted that the learner sitting in a classroom had changed immensely over the years. He summed up the differences “Today’s learners are no longer the people our educational system was designed to teach.” (PRENSKY, Marc, 2001) He also stated later in the same article that this new breed of learners think and process information in a radically different way to the learners that have gone before.

If this new breed of learners has managed to accumulate their knowledge in a different way to the generations before them, then the only way to approach education is to individualise it to their needs and skills. Therefore if their learning pattern or learning style is known then the act of education and learning should be a more natural experience. Teach for the learner not for the subject. If the new native is so immersed in ICT then it could be assumed that if learning is immersed in ICT learning will be an easy experience.



**Figure 1 Digital Immigrants vs Digital Natives**

The above diagram indicated some of the differences in that way Digital Natives and Digital Immigrants accumulate and process information. But what about the Digital Immigrant, how will they deal with learning through the medium of ICT or e-learning. This project will examine how both aspects of the digital divide will interact with an e-learning tool.

### ***1.4 Research problem***

If a surgeon from the 1900s was placed into an operating theatre of today they would find themselves completely overwhelmed and lost as to what to do. However if we transported a teacher from the 1900s to today and transplanted them into a modern classroom they would probably fit in very well. While technology has progressed immensely the use of IT in the classroom has not kept pace.

The project aims to discuss and evaluate the use of e-Learning and ICT in Adult Education in Ireland. There will be particular attention paid to the teaching of Digital Natives and Digital Immigrants on a computer based subject. The learner's ages will range from 21 to 70 years of age and they will be from mixed work and social backgrounds and mixed computer experiences.

As a tutor in the Vocational Training Opportunities Scheme (VTOS) for over 20 years and PLC for nearly 10 years, I have been teaching mature learners many various IT disciplines, from basic to Advanced MSOffice, Programming, Computerised Accounts and Payroll, Website Design, Desktop Publishing and Digital Photography.

Some of the younger learners will be native to IT while others will be considered to be Digital Immigrants. The Project will also evaluate how learners learning styles interact with their learning of ICT subject and whether E-Learning suits their learning style.

The Experiment will be executed in 5 parts

VARK Questionnaire

Interviews

Pre Questionnaire

Using the eLearning Tool

Post Questionnaire

### ***1.5 Intellectual challenge***

The challenge involved researching learning styles, e-learning tools, in the research literature and presenting these in an easy to understand description.

There are as many varying definitions of how learners learn as there are terms, Learning Styles, Cognitive Styles, Learning Modes, Mind Styles. The terms are on some occasions given very diverse definitions while in some instances they are used interchangeably.

Because both centres are small and are not located in major urban areas, bringing some of the ideas of these concepts to the staff and the learners could prove to challenge.

### ***1.6 Research objectives***

The following objectives have been achieved throughout the dissertation and contributed to the overall outcome:

To define E-learning

To investigate the challenges of teaching and learning of digital immigrants in the context of ICT adult education

To examine learning styles paradigms and the usefulness of learning styles in the delivery of ICT adult education to address challenges of teaching and learning for digital immigrants

To design an e-learning tool cognisant of learning style suitable for a group of adult learners

To critically evaluate the use of e-learning as a tool in the teaching of ICT to digital immigrants as well as digital natives

To produce a set of artefacts to aid in the teaching of ICT to digital immigrants

### ***1.7 Research methodology***

There is a large volume of information already in the public domain regarding Digital Immigrants, Learning Styles and various e-learning tools. However there is little information with regard to the use of these tools in the Adult Education sector in Ireland.

The primary research will be in the form of questionnaires and interviews. The learners in this project will be asked to take 3 questionnaires,

VARK Questionnaire

Digital Native/ Digital Immigrant

Post e-learning Tool experience

There will be interviews conducted with stakeholders who work in the area of ICT training and with learners from the age of 21 to 99.

Feedback was sought from experts in the field of education and learning styles to ascertain the best methods for collecting and summarisation of data.

The secondary research will be carried out on line and in the DIT Kevin St Library and in DIT Bolton Street Library, which houses the DIT depository of Education and Teaching/Training Books. The sources of material will be  
Department of Education and Science  
AONTAS  
European Union Information and various statistical bodies.  
Learning Styles Research

## ***1.8 Resources***

For a successful completion of this project a number of resources are required. The following is the list of the resources which will be required during the course of conducting the research project.

- Laptop computer for writing the dissertation and conducting the research project.
- Internet access, both at home, in work and in DIT.
- Access to DIT library. This will enable easy access to a variety of academic resources such as journals and periodicals in both hard copy and electronic format.
- Access to survey tools. SurveyMonkey
- Access to Students and Tutors

## ***1.9 Scope and limitations***

This study looks at one small sample of Mature Learners based in one VTOS centre and one PLC centre in a narrow timeframe. In order to fully research this topic it would be essential that studies would be carried out in more centres nationally and over a longer timeframe of 2 or more years.

Much of the research on Adult education comes from the States and the UK while Ireland has only recently adopted the term Life Long Learning. There are many courses on offer through the island of Ireland, from Business to Batik, from Art to Water sports. In VTOS Athy, we offer course in Psychology, Art, Childcare, Community Care, Business, Information Technology, English and Maths for Leaving Cert. In VTOS we have 85 students per years studying the above courses. In PLC we have one course on offer in Business and there are 25 students each year. If these courses in Athy and the Curragh were to be researched the project would need to be expanded beyond the 24 students that this project involved. There is the potential to expand this research across the county of Kildare and ultimately across the whole of Adult Education.

### ***1.10 Organisation of the dissertation***

Chapter 2 provides an overview of Adult education in Ireland to date. It also looks at the position of government on providing adult education opportunities to the people of Ireland. This chapter would also provide background on the VTOS scheme in Ireland with specific reference to VTOS in Kildare and mainly in Athy. The reader is given an insight to the opportunities afforded to participants on the VTOS scheme. This chapter will also provide background to the PLC course structure with main reference to the Curragh Post Primary School.

Chapter 3 explains the term Digital Immigrant and Digital Native and discusses their learning differences and their different approaches to ICT.

Chapter 4 will take a detailed look at various learning styles and discuss some of the advantages and disadvantages associated with each style.



Chapter 5 will concentrate on E-learning tools and their usage in education. The principal focus will be on e-learning tools for use in Adult Education and the relationship with learning styles.

Chapter 6 will focus on the design of the experimentation; from concept to delivery. This will include the design of the experiment and the surveys and the justification for decisions taken. In this chapter there will be a description of the tools that were developed for the learners to use. The experiment will consist of a pre-questionnaire, the evaluation, the use of the e-learning tool and the post questionnaire

Chapter 7 will contain the results sections for the VARK Questionnaire, the interviews, the Digital Immigrant/Digital Native Survey and the E-learning survey

Chapter 8 will be the conclusion of the report and recommendations.

Chapter 9 will provide a working glossary of ICT terms for use by Digital Immigrants to help with their transition into the digital world that we all find ourselves in.

Chapter 10 will contain the appendices.

## **2 ADULT EDUCATION IN IRELAND**

### ***2.1 Introduction***

Adult Education was often described as second chance education. The assumption was that the learner either didn't achieve the first time around, or that this was a chance to retrain in new skills. However in recent years the phrase "lifelong learning" (DEPARTMENT OF EDUCATION AND SCIENCE, 1998) has been more aptly applied to the area of Adult Education. Adult Education in Ireland encompasses many sectors from early school leavers (Youthreach), to young people having completed their leaving cert (PLC), to Adults looking for retraining (VTOS) to Senior Traveller Centres. The main areas of focus of this project are on the areas of VTOS and PLCs.

### ***2.2 Government Policy***

Successive governments have overlooked Further Education for many years but finally in 1998 Further Education was given the status that it deserved. This came about with the publication of the Green Paper: Adult Education in an Era of Lifelong Learning (DEPARTMENT OF EDUCATION AND SCIENCE, 1998), and the White Paper on Adult Education entitled Learning for Life (DEPARTMENT OF EDUCATION AND SCIENCE, 2002). These papers were the first signs of acceptance by the government of the importance of adult education, further education and lifelong learning in Ireland. The government also references lifelong learning in the National Development Plan (2000-2006) (IRISH GOVERNMENT, 1999)

- The Green Paper characterised lifelong learning as a process incorporating three dimensions, namely: - Lifelong, Lifewide and Voluntary and self-motivated.
- The White Paper is underpinned by three core principles concerning Adult Education, namely: - Lifelong Learning as a Systemic Approach, Equality and Inter-culturalism.

It was the first time that the State included the population which has left the initial educational system, in its extended educational commitment. The White Paper details how low levels of literacy and poor education levels, particularly among adults, continue to pose fundamental challenges for Ireland in maintaining competitiveness and growth, and in promoting social inclusion. Adult Education has a key role to play in meeting this challenge.

Bearing in mind the different priority groups, current provision and overall budgetary considerations, the Government has decided to focus the development of a framework of second-chance and Further Education provision on four pillars: -

- a National Adult Literacy Programme as the top priority;
- a Back to Education Initiative (BTEI) providing for a significant expansion of part time options under Youthreach/Traveller, VTOS and PLC courses, with a particular emphasis on promoting a return to learning of those in the population with less than upper secondary education;
- an ICT Basic Skills programme for adults as part of the Back to Education Initiative;
- increased flexibility and improved organisational structures for self funded part-time Adult Education in schools.

These are some of the reasons behind the starting of the Vocational Training and Opportunities Schemes (VTOS) in 1991. With the foundation of the VTOS schemes Adult Education has taken a bold step forward in Ireland. But to this day there still is one major stumbling block that faces this hugely important sector and that is the issue of funding. This is plainly visible by the funding that PLC courses receive and the money received by VTOS. On one VTOS scheme recently the new computers they received were the old ones being replaced and thrown out by a secondary school. This was happening at the same time as teachers in another two schools in the county are receiving new Ipads for class work. In another instance the VTOS and Youthreach Schemes were housed in a building that was not fit for secondary school children, as they were moved to a new purpose built school. “The establishment of the new college

- „Colaiste Ath I“ represents the largest ever investment in education in the town of Athy and the new building on the Monasterevin Road contains all the latest in equipment and modern technology for the teaching of all Leaving Cert and Junior Cert subjects.”<sup>2</sup>

The project discussed in this dissertation is focused in the VTOS and PLC sectors. This chapter outlines current practice in adult education in Ireland. The major schemes and awarding bodies are introduced, outlining their perceived function and focus etc. The chapter concludes by presenting an overview of the institutes in which this project was conducted.

### ***2.3 Award Structures in Further Education.***

For many years the Further Education sector in Ireland was run in a very disjointed way. The same can be said for the qualification structure that was in place for awarding qualifications. Some of the awarding bodies were CERT, National Council for Vocational Awards (NCVA), FAS and Teagasc, as well as City and Guilds and Pittman, both from the UK.

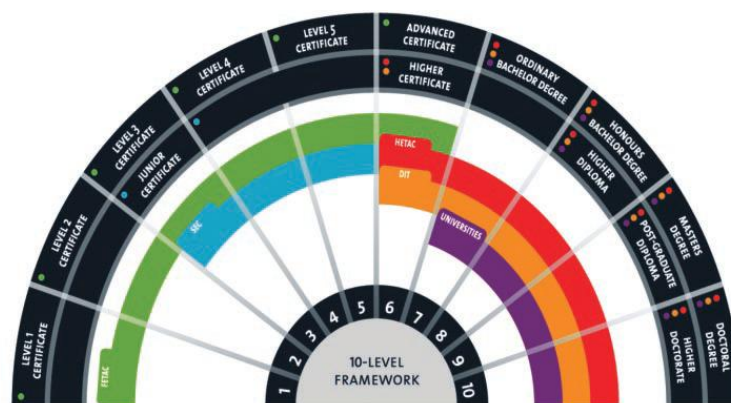
In 2001 FETAC was established following the enactment of the Qualifications (Education and Training) Act in 1999. FETAC is now the only statutory awarding body overseeing the Further Education Sector in Ireland.

FETAC's functions include:

- Making and promoting awards
- Validating programmes
- Monitoring and ensuring the quality of programmes
- Determining standards

---

<sup>2</sup> Excerpt from Athy Community College April/May 2010  
<http://www.athycollege.ie/uploads/1/0/2/6/10262974/apr10.pdf>



**Figure 2 National Framework of Qualifications**

The National Framework of Qualifications “provides a structure to allow learners and employers to compare and contrast levels and standards of different qualifications” (NATIONAL QUALIFICATIONS AUTHORITY OF IRELAND, 2009). The fan diagram is divided into 10 Levels covering everything from Basic Educational needs to Doctoral Degree and Higher Doctorate. It also covers all awarding bodies in the State from the Department of Education, Junior and Leaving Certificates, to FETAC awards, to DIT (Dublin Institute of Technology) other DITs and Universities.

FETAC have responsibility for providing quality assured Awards that are part of the National Framework of Qualifications (NFQ) (see fig.1 above). FETAC assessed awards cover NFQ level 1 to NFQ level 6, from very basic to Advance Certificates.

The following tables show the increase in numbers achieving awards. They are provided for the full number of awards and not grouped by subjects or centre types.

<b>FETAC</b>	<b>2006</b>	<b>2011</b>
Certificates (Major)	26,229	37,857
Component (Minor)	75,703	140,870
Specific Purpose (Special Purpose)	28,028	10,785
Supplemental	196	946
<b>Total number of Award holders</b>	<b>130,226</b>	<b>180,690</b>

**Table 1 FETAC Award Statistics 2006, 2011 (FETAC, 2007), (FETAC, 2012)**

A Major Award is provided to learners who have achieved 8 component (Minor) awards in a specific area of learning. For example an Award in Business or in Childcare

A Component or Minor award is provided to learners who have achieved a minimum of a pass in a particular subject area, e.g. in Spreadsheet Methods, or Communications. All Minor awards are graded at Fail less than 50%, Pass 50% -64%, Merit 65%-79% and Distinction at 80% and above.

The gender balance has been maintained throughout the development of FETAC, but with a slight swing in female recipients in recent years.

<b>Gender</b>	<b>2006</b>	<b>2011</b>
Female	49%	52%
Male	51%	48%

**Table 2 Award Recipients by Gender**

(FETAC, 2007), (FETAC, 2012)

And finally taking the 2 respective years here are the figures for the age breakdown. These figures have been summarised and grouped for easier comparison.

<b>Age Grouping</b>	<b>Cumulative Total 2006</b>	<b>Age Grouping</b>	<b>Cumulative Total 2011</b>
Under 21	20%	Under 20	12%
21 - 29	28%	21 - 29	27%
Over 30	37%	30 - 49	43%
Over 50	11%	50 - 54	16%
n/a	3%	n/a	
n/a - learners who entered incorrect Date of Births			

**Table 3 Age Distribution FETAC Awards 2006, 2011**

(FETAC, 2007), (FETAC, 2012)

The figures from the FETAC website for the two years 2006 and 2011 are grouped in a slightly different manner, but when summarised there can be seen to be a cumulative increase in the number of over 30s from 37% to 43% and over 50s from 11% to 16% who achieved certification from FETAC. These two indicators show the increase in the number of older learners returning to education or to retraining. This highlights the continued need for Further Education in Ireland.

## ***2.4 The Current State of Play***

Second Chance/Adult Education/Further Education encompasses a number of programmes which include Vocational Training Opportunities Scheme (VTOS), PLC, Back to Education Initiative (BTEI), Youthreach, Senior Traveller Training Centres, Adult Guidance, Adult Literacy<sup>3</sup> and Education Equality Initiative (EEI)<sup>4</sup>.

Ted Fleming in his journal article on *“The State of Adult Education”* draws a comparison between the situation Adult Education finds itself in and the States involvement in Adult Education. He also insists that *“lifelong learning must be clearly established as a right”* (FLEMING, T, 2004). Adult education is not just about teaching a subject but is fundamentally an *“education that speaks to people’s highest aspirations; that aims at reaching the full potential of what it is to be an adult and opens the possibility that adults will be able to engage in the most significant kind of learning possible”* (FLEMING, T, 2004).

One of the biggest problems facing the entire Adult education sector in Ireland is the involvement of the state and its setting of standards and assessment of standards. Governments and the general public demand to see a return on investment, value for money etc. The main standard that is applied through the education system is results, but more so results in formal examinations, the ABC count. While it is beneficial for learners to achieve grades and results, this form of assessment omits a huge portion of real education i.e. the personal development of the learner and the empowerment of the

---

<sup>3</sup> For more information on the Further Education Sector  
<http://www.education.ie/home/home.jsp?pcategory=11397&ecategory=11397&language=EN>

<sup>4</sup> For more information on EEI please follow this to AONTAS  
<http://www.aontas.com/about/annualreports/archive/20040722162821.html>

learner as a fully developed adult. This cannot be measured with slide rules and graphs. Results from the Organisation for Economic Co-operation and Development (OECD) International Adult Literacy Survey show “that one in four working age adults had problems with even the simplest of literacy tasks” (NALA, 1997)

Adult education should be about the betterment of the person and the awarding of results. However this is not the case in some further Education courses. Many of the courses are just about the award. Many people who have become unemployed need to be retrained and certified but that is only half of the battle. These learners have undergone one of the most traumatic experiences in their life, that of losing a job, many of whom have worked in the same job for 20 or more years. (HOLMES, T and Rahe, R, 1967) The recently unemployed learner needs a readjustment period with support to re-evaluate their existence. This cannot be achieved in a short 6 week course where the emphasis is just on the recertification of the learner. One such body offering these types of courses has been FAS<sup>5</sup>. The Training and Employment Agency(FAS) offers courses on a part-time, full time and evening basis for people wishing to improve their skills. (FAS, 2012)

The results driven *bring them in, churn them out* approach to education that is delivered by FAS is where recertification is the deciding factor. And we have seen all too well in Ireland the fiasco that is FAS, from huge misspending of finances (INDEPENDENT.IE, 2010(a)) to the tampering with results in FAS centres. (INDEPENDENT.IE, 2010(b)) This is what can happen when results are the yard stick. Yet funding still flows into FAS in vast amounts! Moving towards the future FAS and the VEC Adult Education sector are to be amalgamated into one body “SOLAS”<sup>6</sup> with full oversight of all further education need in Ireland. Unfortunately most of the new board of SOLAS are the old board from FAS.

Over the many years of tutoring in the Further education sector in VTOS there has been so many examples of students achieving outside of the award spectrum. The following anecdote illustrates some of the examples:

---

<sup>5</sup> FAS – Training and Employment Agency <http://www.fas.ie/en/Training/Home/default.htm>

<sup>6</sup> Further Information on SOLAS <http://www.solas.ie/>



*A few years ago there was a learner who had difficulties writing and as a result was suffering from low self esteem. For years he had holidayed in a certain part of Ireland where there was a light house. Each year his children had asked to visit the lighthouse, but he had always given them some excuse. The real reason was that in order to visit the lighthouse he would have had to write a letter to the organisation overseeing the lighthouses. This he felt he was unable to do. In his first year on VTOS he had taken courses in basic computing, basic maths, English and personal development. Near the end of that year he wrote a letter seeking permission to visit the lighthouse. That summer his children had a huge surprise in store for them when they visited the lighthouse on their holidays. The sense of pride this learner exhibited, when he recounted the joy on his children's faces after they visited the lighthouse was remarkable. This pride was because he had overcome his fear by writing a simple letter.*

This result will never be seen on a league table or results sheet, but he was well on his journey to achieving his full potential.

Another problem with Adult education is the requirement for tutors to be seen as teachers with teacher training by the Teaching Council. The fact that for a long time the only qualification that was acceptable for teaching in further education was a post primary teaching qualification. Thankfully in recent years there has been an acceptance of the simple fact that teaching adults is a different experience to teaching children. There are now courses for training tutors in adult educational philosophies like those offered by NUI Maynooth<sup>7</sup>, Galway and many other colleges and universities throughout Ireland.

## **2.5 VTOS Athy**

VTOS Athy opened its doors to new learners in September 1992 with 10 tutors and a quota for 20 learners; we have now grown from that humble beginning to 70 VTOS learners and 20 Back to Education Initiatives (BTEI) learners. Within Kildare VEC

---

<sup>7</sup> NUI Certificates at levels 8,9 in Adult and Community Education

there are 3 VTOS centres in Newbridge, Leixlip and Athy. Country wide the total number of learners on VTOS schemes has increased from 4,100 in 1995 to 5,600 in 2004. (DEPARTMENT OF EDUCATION AND SCIENCE, 2007)

The VTOS programme in Athy consists of various modules in Childcare, Business, Computing, Art, Communications, Community Health, Psychology and Leaving Cert Maths and English. The subjects are validated by FETAC at levels 3, 4 and 5. In VTOS the ages range from 21 to 85 but not all learners will take a computer based subject, instead preferring to do Art or English or Psychology, and in some cases avoiding the computer room completely.

VTOS offers education primarily but hand in hand with this is the building of the person. Many Adults coming through the doors of VTOS may not have had a great educational experience the first time around, if there even was a first time for some of them. Coupled with this is the fact that many people now find themselves unemployed for the first time in 10, 20 or more years. Nowhere to be on a Monday morning, their structure gone, no work in their area and little hope of re-employment in their sector are all issues that meet the VTOS staff every day of the week. These issues must be addressed alongside the need for retraining and re-education. This is achieved in VTOS by adopting a holistic approach to education. One of the aims of holistic education is to instil in a learner a passionate love of learning and this is achieved in VTOS in a number of ways. VTOS offers subjects at various levels so that a student can take higher subjects in some areas and all the while getting support in a subject area that they may have a difficulty in. Also available to all learners are counselling and career support services. Subjects are taught over a two year period providing the learner with an opportunity to utilise the two years or complete the courses in one year.

According to a recent post by AONTAS there are five priorities for further education in Ireland, two of the points are already in existence within the VTOS structure and in particular in VTOS Athy

- The adult learner must be at the heart of the further education and training service.

- The benefits of further education and training beyond access to the labour market need to be recognised.
- Access to quality information and Guidance must be a key feature of the further education and training service. (AONTAS, 2012)

Because of the changes coming down the proverbial pipeline there is a necessity more than ever to have the voice of the learner in every aspect of these changes. From course solutions to training to policy decisions the adult voice needs to be the fore. VTOS Athy has always had this belief at its core; the centre is nothing without its learners. As has been mentioned anecdotally earlier the benefits of adult education don't stop at the job door. AONTAS carried out research in 2011 that identified the non job benefits of adult education such as community involvement, volunteering, and personal development, to reach *"the full potential of what it is to be an adult"* (FLEMING, T, 2004). The VTOS schemes have been offering Guidance services since the beginning of the schemes and counselling as well. Within the VECs over the last number of years they have built up an excellent service in guidance across each county which needs to be built upon going forward.

Initially in VTOS it was noted that most participants had little or no computer experience and therefore IT courses were provided at a very basic level. However this has changed with many of our current learners being categorised as Digital Natives. (PRENSKY, Marc, 2001)(Bennett et al., 2008)

Over the intervening years there has been a marked increase in the number of learners where English is not their first language as well as learners who are returning to study to seek places in college or as a career change. Some of these learners will have had full careers and are now looking to change focus. Many of them will have used computers at some level and are now looking to expand on their knowledge.

This age division is even more distinct in the PLC Course where there are learners as young as 18 and as old as 60 taking the same modules, most being in the computer area.

## **2.6 PLC**

PLC courses in a lot of cases have their beginning in the Secretarial courses offered throughout the 1970s and 1980s in VEC schools. These courses were as the name suggests to offer mainly females the opportunity to learn the skills necessary for employment as a secretary, such skills as typing, shorthand, letter writing, note taking etc.

As education moved on these Secretarial Courses were replaced by PLC courses in 1985 to provide appropriate vocational training for young people to bridge the gap between school and work. This was achieved by offering a wide range of skills from Business, Art and Design, Computing, Legal Studies, Childcare and Beauty Courses. The profile of the learner has also evolved to most courses having both males and female learners. While the numbers of learners enrolling on PLC courses has increased from 15,200 in 1991/92 to 28,650 in 2002/03, women have consistently outnumbered men with the female male divide being 72%:28% in 2002/03. (DEPARTMENT OF EDUCATION AND SCIENCE, 2007)

The PLC course in the Curragh Post Primary has always had a cohort of mature learners approximately 20%, which brings an added benefit for all other learners. Many of the learners would be from within the Curragh Post Primary School itself and a large number of learners from the surrounding secondary schools. The course offers Business Studies with French, offering learners a choice from 13 subjects. They must complete 8 modules to achieve a full award. These courses like those provided in VTOS are validated by FETAC.

PLC courses offer learners the chance of an alternative route to College and University if their original leaving cert results were not sufficient. The PLC is invaluable to smaller schools like the Curragh because it offers the students another chance at improving on their leaving certificate results whether it be for college or for employment. This past year there are possibly 20 out of the 25 learners that completed the course in a position to apply for college based on their FETAC results alone.

## **2.7 Conclusion**

This chapter looked at the state of Adult education in Ireland. Adult education is second chance education but is treated as second class education by Government and Department of Education. There needs to be a cohesive approach to the retraining and re-education of adults in Ireland. Adults who have been unemployed recently or in the distant past don't just need the practical skills education; they need the support to make this change, to reach "*the full potential of what it is to be an adult*" (FLEMING, T, 2004) in today's ever-changing society that is Ireland in 2012.

Adults also need to be trained on the most up to date systems that are available and not treated like lower class learners as has been the case in the past. There are vast amounts of great work being achieved in Adult Education and Community Education centres across this island by tutors with knowledge and passion and the love of teaching Adults in different environments, so why should they suffer because of Government cutbacks and rationalisation plans.

The real issue is that the Government and Department of Education and Science are playing catch-up with the Adult Education and Community Education sectors in Ireland.

### **3 DIGITAL IMMIGRANT VS DIGITAL NATIVE**

#### ***3.1 Introduction***

As discussed in the previous chapter 12% of all FETAC awards were presented to the Under 21 age group, with 43% being awarded to the 30-39 age group and a further 16% to the over 50, one of the biggest challenges facing Adult Education and Further Education is diversity of ages. This becomes even more exacerbated when the information age in which we live, work and play is taken into account. The main skill set that is required in the information economy is the ability to utilise the information and communication technology that is all around and this becomes a complicated issue when the diversity of ages and background is added to the mix. A key issue in Adult Education is the training of computer literacy to the widening age groups that reside in a modern adult education class.

With the advent of computers in the 60s and 70s and the infiltration of the PC, Mac and internet into our places of work initially and in more recent years into our homes and very recently into our everyday lives and social environments, there has been a question regarding the effect of this ingression on the very matrix of our lives. Does it change who we are? Do we think differently? Do we learn in a completely different way to previous generations?

#### ***3.2 Background***

There are many terms affiliated to the youth of today, Digital Natives (PRENSKY, Marc, 2001) Generation Y, Generation We, Generation Sell, Millennials (STRAUSS, William & Howe, Neil, 1992), Generation Next (PBS, 2012) and the Net Generation (TAPSCOTT, D, 1998)

The use of these terms purports to distinguish this generation from the generation that went before. So how does this generation really differ from the preceding generations?

The debate about the classification of people as either Digital Natives (PRENSKY, Marc, 2001) or Digital Immigrants is a debate that has been ongoing since 2001. Prensky's definition of Digital Natives has been applied to anyone born between 1980 and 1994. The term "Net Generation" (TAPSCOTT, D, 1998) has also been applied to this group of young learners. Prensky described this group as "surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age" (PRENSKY, Marc, 2001).

It is held by many that this new generation of learners have many different abilities and skills which have been fostered by their immersion in the digital realm. They are described as multi-taskers, experiential learners and dependent on technology for information gathering and socialising. This form of immersion in technology can alienate others and so they shun the technology or come to IT from a different perspective becoming users of technology - Digital Immigrants, but not fully immersed.

They may learn "to adapt to their environment, but they always retain, to some degree, their "accent," that is, their foot in the past." (PRENSKY, Marc, 2001)

Tapscott in his book *Grown Up Digital* coins the phrase the Net Generation. This labelling encompasses anyone between the age of 11 and 30 who like Digital Natives have grown up immersed in technology and the internet. He outlines eight norms of the Net Generation.

- Net Geners want freedom in everything they do.
- They want to customise everything, their browsers, their phones even their entertainment.
- A breed of users who demand transparency. They don't just accept the supplier's word.
- They want to use companies whose values align with their own, they demand integrity and openness.
- They want play at home, at work and at play. They live in interactive experiences.

- They prefer to work in groups, maybe not physically but interactively, they facebook, they tweet, and online games with multiple users are the norm. They are connected
- They live for speed, because they are connected everything must happen in real time, the here and now.
- They seek innovation; they demand the latest and greatest in all things.

Prensky's Digital Native, Digital Immigrant looked at the concept of teaching young people in today's (2001) education system. He states that a *“really big discontinuity has taken place”* and that is the *“arrival and rapid dissemination of digital technology in the last decades of the 20<sup>th</sup> Century”*. (PRENSKY, Marc, 2001)

He sees the Teachers as Digital Immigrants trying to teach IT to Digital Natives. His main thrust is that educators have to learn to teach differently to Digital Natives because they see and experience the world differently. Therefore they learn differently. The Bruges Communiqué on Vocational Education and Training states that “Participating countries should improve initial and continuing training for teachers, trainers, mentors and counsellors by offering flexible training provision and investment. The ageing European teacher and trainer population, changing labour markets and working environments, together with the need to attract those best suited to teaching; make this objective even more critical. Traineeships for teachers and trainers in enterprises should be encouraged”. (EUROPEAN MINISTERS FOR VOCATIONAL EDUCATION AND TRAINING, 2010b) This communiqué highlight the need for retraining of teachers because they are getting old and again states that there is a need to attract teachers that are better suited to the job.

Digital Natives experience the world in multiple modes, image, video, sound, game.

Prensky claims that digital natives

- use IT language- TEXT Computer terms
- Prefer graphics over Text
- Live in and are surrounded by ICT
- Work and Play Online and prefer to connect via Facebook, text



- Are Multitaskers
- Instant everything and everything instantly- they live in a here and now world, whether it is information or communication
- Inform other about events by posting pictures on Facebook (visual versus verbal or text stories) (ZUR, O. & Zur, A., 2011)
- The news that is important comes from friends via Facebook (political discussions on walls), Twitter, political blogs not just news sites
- Live their life online in the open for everybody to where they may have hundreds of “friends” and they are not afraid to be known, not especially concerned with privacy

Everywhere around there is a young person, listening to headphones, texting and probably facebooking four conversations all at the same time and playing some computer game with the TV on in the background or in a study with headphones on.

A Digital Immigrant according to Prensky would find this world an absolutely traumatic experience. They prefer to

- use text instead of images
- Use proper English
- a world without ICT
- work together physically
- work on one task at a time
- prefer face to face contact or phone conversation
- prefer to receive information in a slow, linear and logical manner
- receive news from traditional news programmes or news sites such as independent.ie or examiner.ie etc or print news media (ZUR, O. & Zur, A., 2011)

In his second article Prensky claims “*Digital Natives’ brains are likely physically different as a result of the digital input they received growing up*”. (PRENSKY, Marc, 2001b). He also references the fact that the Digital Native tends to get bored easily with old ways of teaching and learning but can be lost for hours on games etc.

Prensky states that in teaching digital natives a teacher must adapt to teaching in a different way,

- It means going faster
- Less step by step instructions
- More in parallel
- More random access

So according to Prensky teachers need to develop two kinds of content; the “Legacy” material which includes reading, writing, arithmetic, logical thinking, and ideas of the past, in other words the more time honoured traditional curriculum and the “Future” material which is grounded in digital and technological and includes software, hardware, robotics etc. (PRENSKY, Marc, 2001)

### ***3.3 The Flip Side***

While there are arguments for Prensky’s case there are many arguments against. Many, many researchers have argued that age, availability of IT and other factors don’t necessarily cause a person to think or work in a different way.

Such researchers as Bennet and Maton oppose the idea of tech savvy digital natives learning in a different way “that is not to say that education should not change at all, but merely, that the basis of the argument, as it is currently made, is fundamentally flawed” (BENNETT, S & Maton, K, 2010). They also dismiss Prensky by stating that there is no empirical research to support Prensky’s claims. They also state “The past becomes a ‘foreign country’ and the young and old are considered to inhabit different worlds. Given the research evidence to the contrary and the illogic of such a position, it is futile to continue with these kinds of arguments.” (BENNETT, S & Maton, K, 2010)

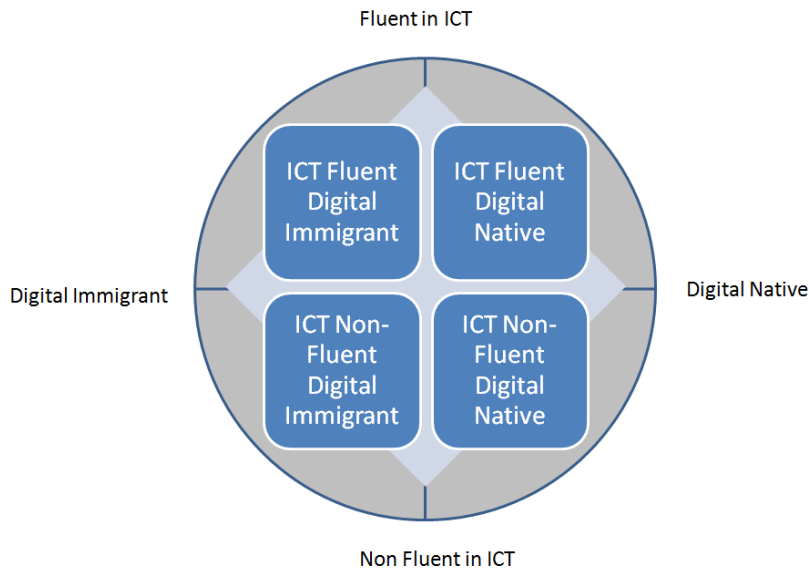
### ***3.4 Is the Digital Immigrant versus Digital Native Paradigm enough?***

For many years this debate has raged on, is it definitive enough to base a learner's ICT skill level just on their date of birth either before 1980 or after. Or is it plausible to assume that somebody born before the 1980s can use ICT in a manner comparable with or better than a person born since the 1980s?

Studies have shown that there are learners on both sides of this argument who will blur this simple divide and even transcend it. In this work I will seek to provide a more realistic representation of the adult learner who may be sitting in your next lecture. Many mature learners through work or just their own learning have bridged the divide and while they may have been born many years prior to the 1980s may in fact be extremely digitally fluent. While there are many younger learners, despite being born since the 1980s may not be digitally fluent at all. Fluency can be measured in a number of ways, for young people they may be fluent in the use of facebook but could not send an email, while a mature user could send emails and attachments and have no interest in facebook. Are both these users fluent?

The term fluent is being used to describe how much usage a person makes of ICT in the work and play. Digital literacy refers to the skills required to achieve digital competence, the confident and critical use of information and communication technology (ICT) for work, leisure, learning and communication. (EUROSTAT, 2010)

The paradigm while based on The Digital Immigrant/ Digital Native divide will also look at the digital fluency of the learner as well. Thus the learner's grid is displayed in the following diagram.



**Figure 3 Fluency in Digital Natives and Immigrants**

In order to achieve this goal I have developed a new questionnaire. Each Question will have four possible answers, and each answer will fall into one of the four sectors as described above.

### **3.5 Conclusion**

This chapter has discussed the views for against the debate on Digital Natives, Digital Immigrants.

This division seems at its centre a very simplified reason as to why someone can use technology or not. As a starting point it can allow a tutor to made a judgement call based on the age of the face in front of them. Are we doing an injustice or is the assumption justified?

The basis of one of my questionnaires will be to examine the reality of this divide in a classroom environment and to test if there are indeed those learners that transgress the Digital Native, Digital Immigrant Paradigm.

## **4 LEARNING STYLES**

### ***4.1 Introduction***

The focus of this chapter will be in providing an overview of the many different methods that are being used to examine different learning styles.

Over their careers mature learners have learnt many things, computers included, but they may not have been in a classroom environment in 20 or 30 years. This has given many of them the opportunity to learn in a different way maybe a way that suits them better.

Many mature learners come from a situation where they were in the class to be taught rather than to interact and learn with the tutor. This old school system is what Paulo Freire described as the banking approach to education. In that system learners were empty vessels to be filled up with knowledge and the teacher having all the answers (FREIRE, Paulo, 1970). Freire's approach was a more interactive journey through learning where all in the room, teacher and learners were learning and working towards education. This is a major difference that we incorporate into adult education, and can be difficult for many learners to comprehend because they still have the idea that the teacher has all the answers.

The first major issue with regard to using e-learning tools is to realise that not all learners learn in the same way, so can we teach in the one way for all learners and how do learners learn.

### ***4.2 Myers-Briggs Type Indicator Tests***

Over many years there have been many different approaches to learning styles, initially Carl Jung a Swiss analytical psychologist categorised people in terms of 8 personality patterns. For example do learners prefer to work in groups Extroverted or alone Introverted. He also proposed that learners learn by Sensation or Intuition, by Thinking or Feeling and by Judging or Perceiving. Carl Jung's theories led to the development

of the Myers-Briggs Test by Isabel Briggs Myers in 1943. These tests have resulted in an enormity of information about how personality affects learning styles. (MYERS & BRIGGS FOUNDATION) The Myers-Briggs Type Indicator Test (MTBI) focuses on the description of normally seen personality types. See table below.

Extraversion (E)	Introversion (I)
Sensing (S)	Intuition (N)
Thinking (T)	Feeling(F)
Judging(J)	Perceiving(P)

**Table 4 Four Bipolar Scales of MBTI**

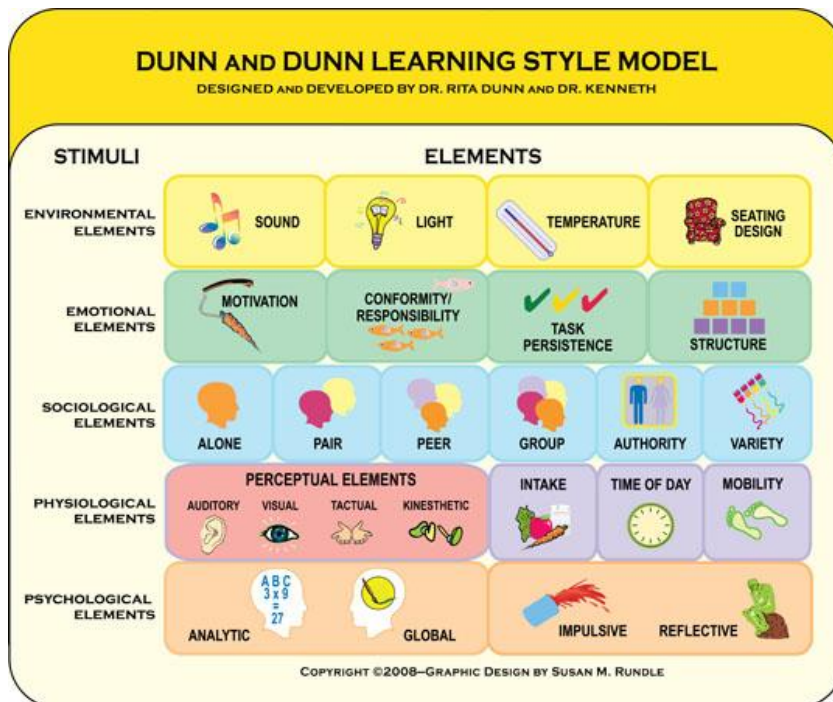
The user or the MBTI test are provided with 93 forced choice questions, the user has to pick one answer on each question and only one answer. From the answers supplied, scores are calculated to provide one of the possible 16 combinations of preferences. Below are examples of some of the possible combinations.

Type	Positive traits	Negative traits
INFP	Artistic, reflective, sensitive	Careless, lazy
ENFP	Enthusiastic, outgoing, spontaneous	Demanding, impatient

**Table 5 MTBI Example of Personality Type Combinations**

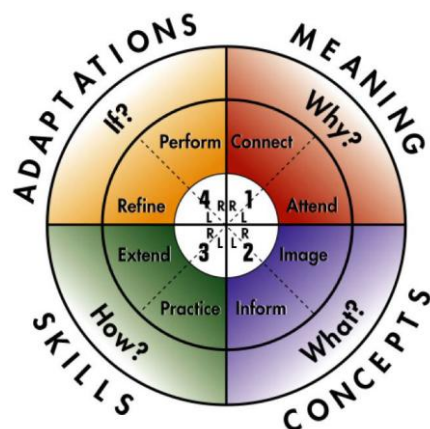
### ***4.3 Dunn and Dunn Model***

Another Model that has widespread usage is the Dunn and Dunn Model (1970). This model indicates that a range of 5 different stimuli and 21 different elements can affect the way in which we learn, work and study. Some of these elements are developmental while others are biological. This model takes into account the actual environment in which a learner excels, so a learner may prefer a colder room with music on while another may excel in a silent warm room. This could provide a challenge if this model was to be used in a classroom environment. See diagram below for a complete list of the stimuli and elements.



**Figure 4 Dunne and Dunne Model**

#### 4.4 Bernice McCarthy- 4MAT



**Figure 5 McCarthy 4Mat System**

The 4MAT System (MCCARTHY, Bernice, 2011) is a way of delivery instruction in a way that appeals to all types of learners. It differentiates based on those that reflect and

those that apply action, and those that experience and those that conceptualise. It lays out a programme to be followed that moves clockwise through the quadrants starting with Why, What, How and ending with If.

- In the WHY stage the teacher connects the learner to the concept and Attend-guide learner to reflect.
- In the WHAT stage the teacher provides a Metaview of the subject- Image and references the body of knowledge- Inform
- In the HOW stage the teacher provides hands-on activities- Practice and encourages expanding the taught ideas- Extend
- The final stage IF guidance and feedback are given Refine and support is provided in the learning and sharing of the idea - Perform

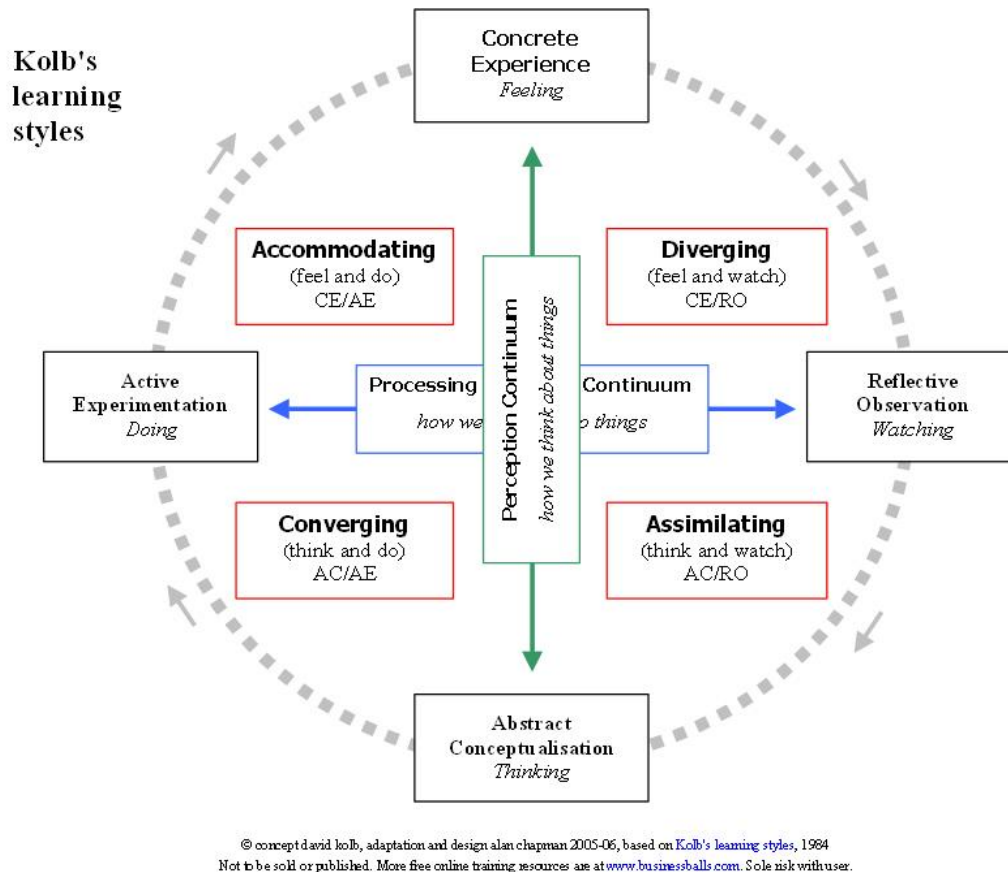
Anthony Gregorc's work – Mind Styles Model (1984) divides the way in which the mind works into 4 distinct sections based on Perceptual Qualities - Concrete and Abstract and Ordering Ability – Sequential or Random. (GREGORC ASSOCIATES INC, 2011)

- Concrete enable the learner to receive information from the 5 senses so as to assimilate information from the present as they experience it.
- Abstract this is where the learner conceives ideas and looking beyond the here and now.
- Sequential ordering is the ability to order information into a logical train of thought.
- Random ordering is the order of information by chunks and can jump around the process.

Gregorc also developed the *Mind Style Delineator* as the instrument for measuring these four learning style categories. The learner plots their individual learning style along the four CS, CR, AS and AR planes. The result is then analysed to provide the learner's Mind Style.



David A Kolb's model deals with experiential learning is based on 4 elements, Concrete, Experience, Observation and Reflection in which the learner "touches all bases" (MCLEOD, S.A., 2010). Kolb's learning style model was first published in 1984 and from that Kolb's Experiential Learning Theory (ELT) and Kolb's Learning Style Inventory (LSI). The LSI was revised from an original 9 item self report scale to 12 items in 1985.



**Figure 6 Kolb's Learning Styles (ALAN CHAPMAN, 2005)**

The major difference with Kolb's learning style is his understanding that a learner's learning style is not fixed and permanent but can change from situation to situation. He does however state that over a longer period changes may not be that dramatic.

A deviation on Kolb's 4 element model is the model proposed by Honey and Mumford, but they produced their own 80 question Learning Styles Questionnaire in 1982 (HONEY, P & Mumford, A, 1982) and revised this down to 40 questions in 2000 to allow for a more time efficient survey. The styles closely resemble Kolb's styles but they have changes the titles. See the table below

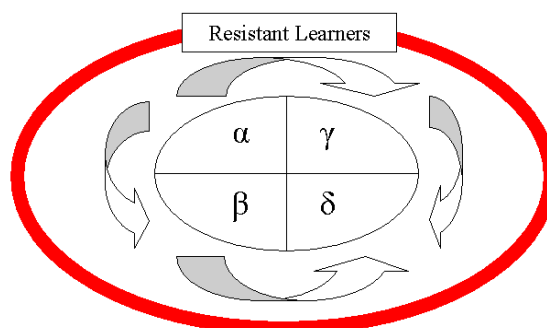
Kolb's	Honey and Mumford
Active Experimentation	Activist
Reflective Observation	Reflective
Abstract Conceptualisation	Theorist
Concrete Experience	Pragmatist

**Table 6 Comparison of Kolb's Styles and Honey and Mumford (CASSIDY, Simon, 2004)**

It is agreed among an extensive group of educators “that learning styles exist and acknowledge the significant effect that learning styles have on the learning process” (VINCENT A., Ross D., 2001), however it is essential not to differentiate between the way the subject is taught by the tutor and the way the subject is learned by the learner because it is also generally agreed “that the most effective learning occurs when the learning activities most closely match the learners preferred style” (GORDON DAMIAN, Bull Gordon)

Two aspects of learning that Gordon-Bull incorporate into their Four Quadrant Learning Style Model are

- The Resistant learner who may have an inherent fear of ICT or may lack the skills to utilise ICT effectively.
- Evolutionary Models of Learning, there is an assumption that learning styles don't change or that a learner can't change their style. Kolb was one of the few how realised this possibility.



**Figure 7 The Gordon - Bull Metaodel of learning styles**

In recent years Neil Fleming has proposed another form of categorization of learning styles in his VARK modes of information exchange. (FLEMING, N.D. & Mills, C., 1992) VARK Modes are

- Visuals
- Aural
- Read/Writer
- Kinaesthetic

It is also possible for a learner to be Multimodal where two or more modes have developed equally. Fleming looks mainly at how we receive our information rather than how we process it.

#### ***4.5 VARK Learning Style***

VARK was developed by Neil Fleming and C Mills in 1992 after years of working as an inspector and lecturer in New Zealand. VARK is an acronym for Visual, Aural, Read/Write and Kinaesthetic. Fleming added the R to the pre-existing VAK systems because he believed that while learners may be visual some prefer the written word to the use of images and/or symbols. (FLEMING, Neil and Baume, David) The VARK system is considered advisory rather than predictive or diagnostic.

The VARK questionnaire provides participants with a profile of their learning style and is not a learning style in itself. A learning style would have 18 or more different dimensions to it which would include participant's preferences for light, heat, working in groups or solo, food intake etc. Learning styles is a term used to refer to the methods of gathering, processing, interpreting, organizing, and thinking about information (MARCY, Vanessa, 2001)

VARK Modes are

- Visual
- Aural
- Read/Writer
- Kinaesthetic

Fleming looks mainly at how learners receive information-rather than how the information is processed.

Visual – Visual Learners process information if it can be seen or visualised using images, graphs, flowcharts, mind maps and pictures. The Seers

Aural learners are best suited to lecture style situations where they can hear the information being presented. They can also benefit from tape and radio playback systems to receive their information. Aural learners also like to talk about their learning so that they can hear it back. The emergence of the podcast has hugely aided this group of learners. The Hearers

Read/Write learners are visual except that their preference is for the written word. Note taking is one of their strong points so that they can read over them again and again. Text based information is also a major source of information so the internet, PowerPoint and computers in general are a Mecca of knowledge awaiting these learners. The Readers

Kinaesthetic learners like to acquire their information through experience and practice. Learning happens best when demonstrations, videos of real things, and case studies. The Doers (RAMAYAH ET AL, 2011)

However many learners can be multimodal, which means that they can learn though more than one mode, for example a learner may be Aural and Read/Write.

In one case study carried out in Emory University entitled “Adult Learning Styles: How the VARK© Learning Style Inventory Can Be Used to Improve Student Learning” first year students were provided with the VARK questionnaire and there appeared to have had a positive effect on the first year students and merited further trials and evaluations. (MARCY, Vanessa, 2001)

## **4.6 Conclusion**

This chapter provided an overview of some of the many different learning styles that are in use in education and business.

Myers- Briggs Type Indicator tests are very complex and without the proper training could be very easy to misinterpret the results. The other main criticism with the test is that the user has to select one of the choices for every question even if none seem appropriate. “The ipsative scores that derive from forced-choice measures tend to yield negative intercorrelations that are difficult to interpret” (GIRELLI, SA & Stake J, 1993)

The Dunn and Dunn Model while it covers many external stimuli and environments to facilitate the learning experience of the learner would not be an appropriate model for a classroom environment. The Dunn and Dunn model is extremely personalised to each individual's preference for a learning environment. In a large group this model could become unattainable; some learners would prefer noise/music while other learners would demand silence, some a cold room while other a heated room, some early in the morning while other would prefer later in the day.

The 4Mat system as proposed by McCarthy is more aligned to the teaching of a subject rather than the learning of the subject, so for the experiment this would be ineffective.

Gregorc's Mind Style Delineator has the traits of a complex and time consuming exercise and the outcomes would be complex to apply.

The Gordon-Bull metamodel recognises the need to ascertain the level of ICT of the learners before taking on some of this learning style surveys. That is why I have decided to look at the paradigm of the Digital Native and the Digital Immigrant as part of the experiment.

I have chosen to use the VARK model to ascertain the learning style of the learners involved in the experiment. The reasons are as follows

- The VARK Model is easy to use and understand and there is no need for complex training.
- VARK allows learners to omit questions not to be deemed appropriate or unable to answer
- VARK allows for multiple answers to each question. Because sometimes one answer just doesn't fit perfectly.
- Learners can be deemed to be Multimodal in other words they may use two or more modes of learning equally

## 5 E-LEARNING TOOLS

The focus of this chapter will be to discuss the aspects of e-learning and how to utilize them with reference to teaching of ICT.

### 5.1 *E-Learning the Myths*

E-Learning is one of the new buzz words that are circulating but it has its roots in the old CBL system or Computer Based Learning System and also in Internet Based Training (IBT) or Web Based Training (WBT). The onslaught of Digital technology has changed forever the way we learn. In our school system teachers are using ICT from primary classes to Higher Level Institutions.

So what is E-Learning? One definition is the use of technology to design, deliver, select, administer, support and extend learning. In E-Learning the computers role has moved away from just click and do exercises of the original CBT systems to being more interactive and collaborative systems allowing learners to share knowledge. Elearning according to Clark and Mayer (2008) is any instruction that is delivered on a computer which has the following characteristics

- Included content that is relevant to the learning feature
- Uses instructional methods such as examples or practice exercises to help learning
- Uses a variety of media elements to deliver the content and methods
- Builds new knowledge and skills which are linked to improved organisational skills (CLARK, RC, & Mayer, RE, 2003)

When we use e-learning tools in education the learning style of the learner becomes very important. In one study carried results showed that learners with learning styles that learnt best through lectures and papers and those that learnt best through field work and observations did better with the e-learning methods. (MANOCHEHR, Dr Naser-Nick)

One of the biggest pitfalls that can occur when referring to e-learning tools is to spend too much effort on the tool while negating the actual effect on the learning. (SIEMENS, George, 2001). While it is beneficial to learn in your best style there are cases for learning in the other styles as this may encourage the improvement of these less developed skills. (STASH ET AL.) Britain and Liber in their framework report discusses the advantages and short comings of some of the available eLearning tools (BRITAIN, S. & Liber, O., 2004)

Whether learning is taught by an instructor or the learner uses an e-learning environment Berge believes that in order to create a remarkable learning environment it must include learning goals, learning activities and feedback and evaluation. (BERGE, Zane, 2002)

Finally it is vital that as we move forward with eLearning that we don't lose sight that the goal of e-learning is to learn not to create applications and evaluations but more constructive pedagogies. (NICHOLS, Mark, 2003)

## ***5.2 E-Learning and teaching ICT***

The quandary posed by e-learning and using it to teach ICT is as old as IT e-learning itself. They are very different and yet inexplicably linked. In order for a learner to fully utilise e-learning tools they must have a reasonable degree of computer literacy and fluency in the first instance.

The old adage of education being about the 3R's Reading, wRiting and aRithmetic has grown into four, now including ICT as one more of the basic skill sets by the EU in 2000 (CLARKE, A and Luger, E, 2012) It is also stated that computers are now part of most learners experience.



It is not simply a case of making a policy and implementing it, there also needs to be increased training of the trainers in the use of ICT and in all aspects of pedagogical<sup>8</sup> and andragogical<sup>9</sup> teaching practices. Because, ICT by its very nature is changing and evolving so too the training of trainers needs to change and evolve.

It is true to say that most learners young and old already have access to their own personal ICT equipment in the form of phones, computers, laptops, tablets, mp3 players, digital video, digital cameras and these devices could be used effectively in the training of ICT. The issue tends to be that most of the equipment listed is used by tech savvy people, be they young or old, so there needs the training and investment to support those less tech savvy people.

Some of the benefits of e-learning are explored in The Learning School Project<sup>10</sup> Website in a report by Scoil Mhuire (SCOIL MHUIRE ENNISTYMON, 2011)

- increase in teachers ICT skills
- students create an environment of self directed learning
- students would take more initiative in their work
- reduction in the amount of paper being photocopied

### **5.3 Conclusion**

This chapter provided an overview on the research of e-learning tools. There have been many tools and sites available for years, but most are directed towards primary, secondary and tertiary education but very few towards Further Education and Adult Education.

There are many arguments and blogs debating the teaching of ICT as a standalone subject devoid from the other subjects that are being taught. One such blogger Steve

---

<sup>8</sup> Pedagogy is the holistic approach to education focused on children

<sup>9</sup> Andragogy consists of learning strategies focused on Adults

<sup>10</sup> The Learning School Project <http://thelearningschoolproject.com/>

Wheeler<sup>11</sup> suggested removing the IC from the term ICT and just call it Learning Technology. The reality for most learners returning to Adult Education is that they need to learn the ICT skill set like using a word processor, spreadsheet or a computerised accounts programme if they are to seek gainful re-employment.

The reality is that we can use e-learning tools to teach ICT but that ICT literacy and fluency are needed first.

---

<sup>11</sup> <http://steve-wheeler.blogspot.ie/2010/03/stop-calling-it-ict.html>

## **6 EXPERIMENTATION DESIGN**

### ***6.1 Introduction***

The purpose of the experiment was to ascertain the learning styles of learners using the VARK questionnaire. The experiment was then to ascertain the learner's digital fluency based on the Digital Native/ Digital Immigrant paradigm. The learners armed with this knowledge then undertook a series of exercises on the topic of IF Statements in Spreadsheets, which were provided in the four VARK modes. These exercises were provided in an e-learning environment. The learner was then asked to complete a questionnaire to record their learning experience of using the e-learning tool provided. As a further part of the research, there were interviews conducted with two members of staff on how they work in a class with diverse age groups, and their usage of e-learning tools.

The experiment was subdivided into 5 sub parts

1. VARK Questionnaire
2. The Interviews
3. Digital Immigrant / Digital Native Questionnaire
4. Design and Use of the E-learning tool
5. Post Questionnaire

### ***6.2 Stage 1 – The VARK Questionnaire***

The VARK questionnaire consists of 16 multiple choice questions, which the learner can omit or select a number of the supplied answers. The questionnaire is completed by the learner and the score is then calculated. One major factor of the questionnaire is that multiple answers and omitted answers are allowed. If a singular high score is obtained then the learner is said to have a modal preference for that mode. This scorings allows for a distinction to be made between a mild preference, a strong preference or a very strong preference for a particular mode of learning. For example if a learner scores a 9 in V and the next highest scores are at 2s and 3s, then that learner is said to have a very strong preference for Visual. However if a learner's A score is

only 1 or 2 scores above the rest of their scores then that learner is said to have a mild preference for Aural.

The VARK questionnaire is predesigned by Fleming and was used with his consent.

The other benefit of the VARK system is that learners can be identified with multimodal preferences rather than, like other learning style systems, forcing them into one preference. (BOATMAN, Kara et Al., 2008).

### ***6.3 Stage 2 - The Interview Questions***

A pivotal stage of this full project was the interviews that were conducted with two of the ICT tutors in VTOS Athy. The questions were on a range of topics from their own personal learning to working with digital natives and digital immigrants.

No notes were taken by the researcher during the interview. The interview was recorded on an iphone using the Recorder Pro<sup>12</sup> app. The researcher instead listened to the interviews afterwards and once transcribed used that as the basis for the overview of the interviews.

The purpose of the interviews was to gather more information on the teaching of Digital Natives/ Digital Immigrants in a real classroom environment. This information and the information gathered from the VARK questionnaire was used to inform the design of the Digital Native/ Digital Immigrant Questionnaire, the e-learning tool design and the final questionnaire.

---

<sup>12</sup> Recorder Pro version 4.1.2 Voice recoding app for iPhone available at [www.davacondulting.com](http://www.davacondulting.com)

The first five questions were of a demographic nature which included, name, and on their teaching history, length of time teaching, main areas of teaching and qualifications.

Question 6 was used to gauge their understanding of Mark Prensky Digital Natives, Digital Immigrants paradigm. The next two questions were to ascertain the age and level of students in their classes. Question 9 goes back to the interview to find if there is a preference for the class that they are teaching.

Question 10 -13 inclusive were presented to explore the concept of how DI/DN learn and interact in a classroom environment. Question 14 was used to seek insight into how up to date the ICT staff are with the advancements in ICT today. Question 15 and 16 were used to see if the staff tutors felt that the correct ICT subjects were being taught on the course.

Questions 17-19 were back to the DI/DN dilemma and concentrated on teaching young and old methodologies and game play. Questions 20-21 were on their experiences of e-learning tools. The department of Education and Science have for a number of years been focused on using ICT across the whole curriculum as opposed to a standalone subject. The next two questions were to explore the tutor's perspectives on this point and on the use of Web2.0 tools.

The final two questions were to gauge the tutor's perspective on funding in the Adult education sector and finally what pieces of ICT would be on the wish list if budget was not an obstacle.

The interviews were conducted in person and were recorded. The full transcripts of the two interviews can be seen in Appendix E and F

The interviewee's responses can be found in the results and evaluation chapter.

### ***6.4 Stage 3 - Digital Immigrant/Digital Native Fluency Survey***

This section of the experiment was to try to ascertain whether a learner was a Digital Native or a Digital Immigrant or had crossed the divide and also to ascertain their fluency in the ICT world.

The questions were based on the VARK style of questions with each question providing 4 multiple choice answers. The questions attempted to ascertain the digital fluency or lack of fluency in both the Digital Immigrant and the Digital Native.

The four answers have been divided into the following four groups.

- Digital Native – Fluent (DNF)
- Digital Native – Non Fluent (DNNF)
- Digital Immigrant – Fluent (DIF)
- Digital Immigrant – Non Fluent (DINF)

#### **The Actual Questionnaire**

The first 3 questions are focused on demographic information, name gender and age. The ages categories on the questionnaire correspond to being born in the 1980 approximately. These learners would be according to Prensky Digital Natives and anyone over 35 would be Digital Immigrants.

The remaining questions were provided in a multiple choice format.

4 You are watching the News on TV and one of the items is of special interest to you, how would you find out more about it?

- Immediately Google it on your smart phone (DNF)
- Google it on your home computer later on (DNNF)
- Read later in an on-line paper (DIF)
- Read more tomorrow in the paper (DINF)

A Digital Native would need the information instantly and a fluent would probably use their latest smart phone. (ZUR, O. & Zur, A., 2011)

A Digital Native not being as fluent would use Google.

DIF would use a website (or a Smartphone) but would probably use an online newspaper or news media site to gather the information these sites can be trusted.

A DINF may not even have internet or may not have the ability to use the internet and so would wait for the newspaper or the news on radio or TV. (ZUR, O. & Zur, A., 2011)

5 You are at an event and a well known celebrity is also attending, which of these options would you choose?

- Take a photo and upload to facebook or tweet immediately while the event is still ongoing DNF
- Take a photo and show your friends later DNNF
- Take a photo and email your friend later DIF
- Enjoy the moment and tell your friends later DINF

Fluent Digital Native would experience the event while facebooking tweeting and upload images taken with the camera phone. (ZUR, O. & Zur, A., 2011)

The Non Fluent Digital native would snap way and show friends later

DIF would email photos later, while a DINF would just recount the experience later on wishing they had remember to use the camera on their phone.

6 If you are travelling to a new location that you have not travelled to before, how would you prepare for the trip?

- Use Google Earth with Street View DNF
- Use Google Maps (static map) DNNF
- Use a route planner application DIF
- Ask a friend or use a map DINF

The travel experience is one that crosses the divide but how do the DI and the DN prepare? The Digital Native would use street view on Google maps while a DI would use a map, old fashioned and tactile.

7 You want to get a new recipe for a meal or you are unsure as how to cook the meal, which of the following best describes what you would do?

- Use Youtube, DNF
- Google the recipe online, DNNF
- Google for a recipe site/ use a recipe you saw in a magazine or paper, DIF
- Look up a recipe book, DINF

Digital Natives don't look up books, they Google, they YouTube, they do it all online and that includes ordering food! Digital Immigrants on the other hand do read magazines and newspapers so getting an idea for a recipe from this sources and then looking it up on line would be a given for a digitally fluent person. Whereas, a digitally non fluent Immigrant would simply use a recipe book.

8 Its Holiday Booking time, which of the following options best describes your approach to booking a holiday?

- Visit the hotel website , use trip advisor or other report sites and then book directly DNF
- Get a brochure, look at the website for the hotel, then book directly DNNF
- Do a Google search, and then go to a travel agent and make a booking with them DIF
- Get a brochure and then go to a travel agent and let them take care of all the details DINF

Again the divide based on the online experience and the paper tactile approach would be very clear.

9 You need to check your bank balance what do you do?

- Login online DNF
- Use a phone bank system DIF
- Use a bank link or ATM DNNF
- Wait and go to the bank when it is open DINF

The ultimate Digital Immigrant will wait for the bank to open to queue to physically meet someone to discuss their bank account, because they need the Person to person contact.

10 An urgent email is needed to be sent, how would you cope with this?

- Send the email and attachments DNF
- Send the email and attachments and follow up with a call to say that you sent it DIF
- Don't email them, facebook or tweet them instead DNNF
- Get somebody else to send the email for you DINF

Email would not be sent by a digital immigrant who had no fluency in ICT, while the digital native with no fluency would just facebook the person. Both DI and DN who were fluent in ICT would send the email with attachments, but the difference is that the Digital Immigrant would follow up with an email to ensure that it was sent and received.

11 How long have you had access to a computer?

- All of your life DNF
- Since childhood (under 12 or primary school) DFNF
- In my teens (over 12 / secondary school) DIF



- As an adult (work life/ college) DINF

Digital Natives according to Prensky have grown up with IT around them whereas DN have only come to computers later in life. The reality for Ireland is that a lot of people only came to IT in college or work life because of financial issues and supply of IT in Ireland.

- 12 How long have you had access to the internet?
- All of your life DNF
  - Since childhood DNNF
  - In my teens DIF
  - As an adult DINF

Many houses in Ireland were slow to embrace the internet due to many factors including speed and cost. Comreg the Commission for Communications Regulations in Ireland stated in their latest quarterly report that there are 1,687,083 subscriptions in Ireland. The fixed broadband per capita penetration rate was 23.6% and if mobile broadband is included the rate jumps to 36.3%. (COMREG, 2012) The uptake among adults using the internet has steadily grown from 13% of all adults in 1998 to 82% of all adults in 2010. (AMARACH, 2009) Despite these facts Digital Natives particularly the younger learners will have had access to the internet from a young age, if not at home at least in school.

- 13 You are at work and you have to photocopy double sided, do you
- Do it yourself DNF
  - Get somebody else to do it for you DNNF
  - Get somebody to show you how to do it DINF
  - Read the manual DIF

Digital Natives according to Zur and Zur cannot relate to manuals as they solve problems intuitively by trial and error or push the button and see what happens (ZUR, O. & Zur, A., 2011)

Digital Immigrants on the other hand relish the opportunity to use a manual.

- 14 You are about to buy a book, do you?
- Order it online and wait for it to be delivered DNF
  - Go to your local bookstore and buy the printed book DNNF
  - Download it instantly to your ereader DIF
  - Wait for the movie DINF

Digital Natives according to Prensky prefer images to text, but also they want everything now so waiting for a book to be delivered or going to a shop would seem alien.

15 Have you ever used a blog, wiki, social networking site or microblogging services?

- |                              |      |
|------------------------------|------|
| • Yes, all of the above      | DNF  |
| • Yes, some of the above     | DNNF |
| • No, but I am aware of them | DIF  |
| • No.                        | DINF |

84.2% of all Irish Internet users use social networks in December 2010 (COMSCORE, 2010). 90% of the 15-24 age group have Facebook accounts, 69% of 25-34, 21% of 55-64 year olds and only 19% of over 65s (IPSOS MRBI, 2012)

Digital Immigrants non fluent would have a definite no to the above question. While a digital native fluent would have used them all. A DN non fluent would have used them but would be unaware of the term microblogging, whereas they would have know Twitter.

16 If there was no mobile phone or internet for a day due to power problems, how would a day without technology feel?

- |                                    |      |
|------------------------------------|------|
| • Normal/wouldn't miss the IT      | DINF |
| • Okay/ Do without but get through | DNNF |
| • Stressful                        | DNF  |
| • Nightmare                        | DIF  |

Digital Natives need to be connected “they would just die” if they weren’t. Many aspects of DN’s lives are happening online and they need to be connected. (ZUR, O. & Zur, A., 2011)

17 If you are sending a text message which of the following best describes what you type?

- |                                  |      |
|----------------------------------|------|
| • All Txt message type eg cul8r  | DNF  |
| • a mix of txt and full spelling | DNNF |
| • full spelling only             | DIF  |
| • just ring them                 | DINF |

Digital Native refer to use text speak instead of English, the EU27 inhabitant average number of texts in 2009 was 580, while in Ireland 2,700 were sent per inhabitant (EUROSTAT, 2011)

18 You need to remind yourself of an important appointment, what do you do?

- Set a reminder on your phone DNNF
- Set a reminder on your calendar app and use cloud sharing to add it to all your calendars DNF
- Do you write it in your diary and on your phone DIF
- Do you just write in your diary DINF

The digital immigrant who is not fluent in technology will simply invest in a diary each year, so there is a high probability that a DI Fluent person will use a diary and a phone calendar, the diary may be a work diary where everything has to be noted and recorded. The digital native meanwhile will rely on their phone, but a more digitally astute person may have their phone connected to the cloud so that they can share all their details with their calendars on other devices. A non fluent digital native will just use a reminder on their phone.

19 How much do you spend annually (approx) on new technology?

- less than €50.00
- €50 - €100
- €101 - €250
- €251 - €500
- Over €500

Digital Natives would be the learners that surround themselves with technology, but here another factor may be at play and that is the availability of finance to purchase new technology, so some of the technology may have been purchased by older Digital Immigrants because they can afford it.

20 What was the latest piece of technology that you bought?

- Smartphone
- Mobile Phone
- Digital Camera
- Sat Nav System
- Computer/ Laptop/ Tablet Device
- Kitchen Appliance
- Other (please specify)

This question was included to see what learners are purchasing and can it display DI/DN tendencies. Smartphones and tablets would be considered among the prize pieces of technology to covet. Digital Natives endeavour “to stay ahead of the

technology curve in ways that often exhaust older generations” (WINDHAM, C., 2005)

21 Have you ever bought a product on line? (only 20 answers were received)

- |                                 |      |
|---------------------------------|------|
| • No Never                      | DINF |
| • No Never, have no credit card | DINF |
| • Yes once or twice             | DIF  |
| • Yes regularly                 | DNF  |

77% of Adults surveyed in February 2009 had booked flights online, while 43% had purchased books, cds or dvds. Only 8% had ordered groceries on line. (AMARCH, 2009) The reason for the high number of adults that book flights is that flight booking systems have been around for a long time and so there is confidence in using them.

22 Last Question. Do you play computer games?

- |                                      |      |
|--------------------------------------|------|
| • Yes but only solitaire on my pc    | DIF  |
| • Yes Games on my PS3 or Xbox or Wii | DNF  |
| • Yes on my phone                    | DNNF |
| • No Never.                          | DINF |

Prensky has always maintained that the Digital Native live their lives through games and game experience. So game play is very important to Digital Natives where ever those games reside.

### ***6.5 Stage 4- The Design and use of the E-learning Tool***

The e-learning tool was based on FETAC Spreadsheets Level 5 Module in Spreadsheet Methods. The portion of the course that will be explored is the area of If Statements in Spreadsheets using Excel 2007. The tool was designed as a website offering all the various aspects of the tasks to the learners. The reason for choosing the option of the IF statements as the core of the experiment is that year on year it is the one aspect of the course that learners find most difficult to comprehend. The difficulties vary for every learner but they are unified in their challenges trying to comprehend and apply

the knowledge to other examples in class. Once the understanding of the basic 3 IF statements has been achieved, then the learners can be introduced to more complex IF statements.

#### 6.5.1 FETAC Requirements

The FETAC Spreadsheet Methods Module Descriptor for Level 5, module code B20028 required that If statements are covered on the course. The following two Specific Learning Outcomes that reference IF statements are as follows

10.2.6 use the single condition IF function with relational operators:  
=, <, <=, >, >=, <>

10.3.2 use multiple IF functions with logical operators AND, OR, NOT

The IF statements are also referred to in the Examination Criteria as detailed

generate the following functions: SUM, AVERAGE, simple IF function, multiple IF function, LOOKUP function

In the Project which is part of the module there is also an If statement required as evidence for the implementation stage of the project

Use a simple IF statement

In spreadsheets in general IF statements can be divided into 3 types

- Simple
- Nested
- Compound AND /OR

The Compound AND and OR while very similar in layout will be dealt with as two separate exercises within the experiment.

### 6.5.2 The VARK Input

In order to explore if learning styles aid e-learning the tool will present the learner with the four VARK preferences. Each learner is provided with the choice of their main preference and one other mode of their choosing. If they are Mutlimodal then they will be asked to take one of their multimodes and one of their non multimodes.

The VARK Modes are

- Visual
- Aural
- Read/Writer
- Kinaesthetic

The best way to create the e-learning tool was to design a website in HTML. This allows for full interactivity of the various parts of the experiment. The tool is only one part of a website which can be expanded to incorporate various teaching tools and tips.

For the Visual option

To aid with visual learning the training was provided in decision flow charts and diagrams showing relationships of the various parts of the problem. This was presented in a 4 separate movie presentations. Each movie will cover a separate type of If statement. Each movie is a recording of a PowerPoint presentation covering each of the IF statements. The advantage of using PowerPoint to present the information is that the slides can animated to show how the formulas are constructed and filled in.

The use of video presentation also allows for controlling of the clip by the learner with built in pause and play options. Each clip is set in a white border to assist in focusing the learners attention, and only one frame is visible on screen at a time.

For the Aural option

Included on the page before the exercises are two audio clips from you tube giving overviews of If statements in song. The clips are from Eric Parry at [http://www.youtube.com/watch?v=7PJ0mXC-hk4&feature=player\\_detailpage](http://www.youtube.com/watch?v=7PJ0mXC-hk4&feature=player_detailpage) and from Mister Haggag at [http://www.youtube.com/watch?v=I4UZ4\\_EvacU](http://www.youtube.com/watch?v=I4UZ4_EvacU). The clip from Eric Parry is a play on the If then function while the clip from Mister Haggag is based on the Coldplay Viva la Vida song. Both were used to help the audio learner to gain information about the IF, Then statements.

The actual exercise presentations were supplied in 4 audio files each one covering the IF simple, nested and the two compound statements. The tutorials were created by the tutor to facilitate the learners as they were familiar with the tutor's voice. Again this clips had the advantage of stopping and rewinding in order to facilitate the learners.

The Read/Write

The steps for the learning of IF statements in the Read/Write format were presented in a written bullet point format and were printable. This is in keeping with Flemings VARK schemes for learners with Read/Write preferences.

The Kinaesthetic

For this type of learner the exercises were presented in a "cut out and do" format. Each IF statement had a PDF document included which the learner was asked to print out and cut out the pieces on the right hand side of the page. Each exercise contained up to 6 cut out pieces. The learner was then asked to use the pieces to position the correct piece in the correct place. There will be no aural instructions; all instruction will be on paper with the correct answers on screen.

Each learner will be aware of their preferred learning style before attempting the website part of the experiment. The learner will be asked to use a non preferred VARK Mode first and then to use their preferred VARK Mode. If a Learner has a preferred VARK Mode of A for example, then their first exercises will be a choice in either V, R or K modes. Once completed, the learner will use their preferred mode A.

Upon Completion of the two modes the learner is required to participate in a questionnaire to establish their experience of the lesson in VARK styles and on their use of the e-learning tool.

### 6.5.3 The Website Layout

The website was designed in Microsoft Expressions Web 2 and was hosted at [www.horantech.com/ifs/index.html](http://www.horantech.com/ifs/index.html). The site contains the following pages

- the introduction page (Home page) provides an overview of VARK and the experiments that will follow
- the experiment page provide learners with the four VARK Modes with instructions to start with one of their non preferred modes. Each of these modes brings the learner to a page with each of the 3 IF statements presented in a form that best suits that mode. On completion of the page each learner is given the option of choosing their preferred learning mode or partaking in the questionnaire.

Each Learner is requested to select their preferred mode and complete the exercises on that page. Once completed, they are provided with the option of completing the questionnaire. The questionnaire was imbedded in the page from source code provided by Survey Monkey.

- VARK styles this page provides an introduction to Neil Fleming's VARK Styles (FLEMING, Neil and Baume, David). There are subpages provided dealing with each of the VARK styles and showing how information is taken in, how best to study and how to output the information (FLEMING, NEIL, 2012)
- Materials- this page provides all the audio, video and pdfs used on the whole site. This page also contains a glossary of IT terms.



- About – a little about me and my teaching history
- Links – a list of links to some useful websites that I have encountered on this dissertation journey
- Contact Page – just the contact details

## ***6.6 Stage 5 - The Post Experiment Questionnaire***

The purpose of this questionnaire was to accumulate the learners overall experience of using the website e-learning tool and their VARK preferences to learn If statements.

The purpose was also to ascertain if the learner found it more beneficial to receive the instruction in their preferred VARK mode.

The first 3 questions were to gather the respondent's information regarding their name, gender and age.

Question 4 was to establish if the learner had previously used any elearning tool?

Question 5, 6 and 7 were answered if the learner had used an e-learning tool previously. The three questions were to ascertain the course covered, and their experience. The learner was then linked on to question 9.

Question 8 If the learner had answered No to question 4 they were asked to explain why they had never used e-learning tools before. There were closed questions (multiple choice) provided with an open question if none of the provided answers were deemed suitable.

Question 9 was a rating question where the learners were asked to rate their own IT knowledge, their use of IT at home and at work, and their experience of IT use ad training in a company environment. The rating was provided over 5 values.

The VARK Mode

Question 10 asked the learner to select their preferred VARL Mode.

Question 11 was to ascertain their other mode they chose on the website and why?

### Their Non Main Mode

Questions 12-15 were concentrated on the learners non preferred mode choice. They were asked to rate the experience and provide an explanation. Their input on what would have helped improve and what hindered their experience was also sought.

Questions 16-18 were exactly the same as previous section except the concentration was on their VARK preferred mode

Questions 19 and 20 were to compare and contrast their experiences of the two modes of learning.

Questions 21- 25 were to examine their preferred learning environment, alone or in groups, with or without tutors. The learners were also asked to rate their current course in terms of devices and tutors.

Question 26 was to find out if e-learning tools were available in the future would they use them? This would really tell if the experience was positive.

The final question was intended to be retrospective to ask what the learner could have done to improve their course of study.

## 7 RESULTS AND EVALUATION

### 7.1 The VARK Results

The Survey was carried out online via the Survey Monkey website. In Total 24 learners responded to the questionnaire. The students surveyed were all involved in a Business Studies with Computing Award.

#### 7.1.1 Respondent's Profile

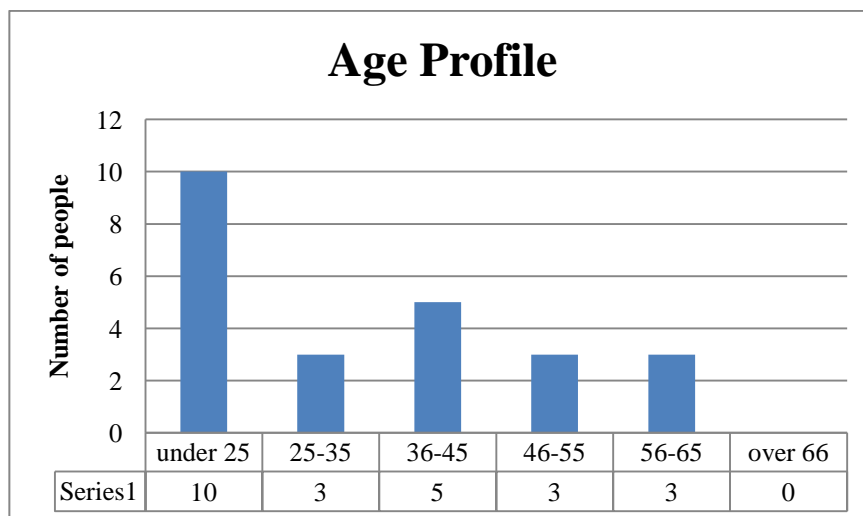
<b>Gender</b>		
Variable	Frequency	Percentage
Male	12	50%
Female	12	50%

**Table 7 VARK Questionnaire Respondents Gender Profile**

<b>Age</b>		
Variable	Frequency	Percentage
Under 25	10	42%
25-35	3	13%
36-45	5	21%
46-55	3	13%
56-65	3	13%
Over 66	0	0

**Table 8 VARK Questionnaire Respondents Age Profile**

Question 3 – Age Profile



**Figure 8 Age Profile**

Course – Business with Computing Award		
Variable	Frequency	Percentage
PLC	12	50%
VTOS	12	50%

**Table 9 VARK Questionnaire Respondents Courses**

The table above displays the profile of the respondents, in terms of the course that they are currently undertaking in 2011-12 term. Out of the sample of 24, 50% were on PLC and 50% were on VTOS.

### 7.1.2 The VARK Matrix

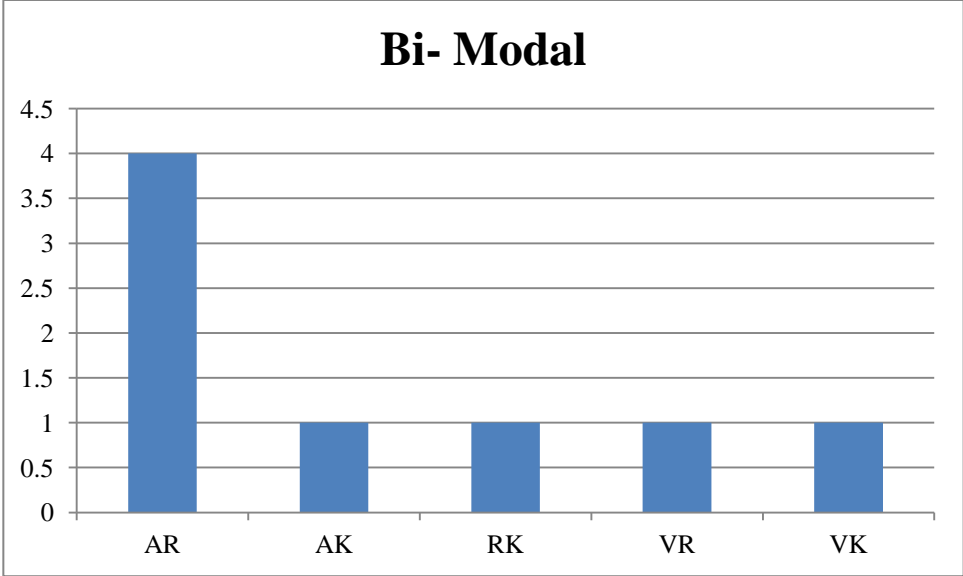
The Results were collated and a matrix was applied to ascertain the V-A-R-K preferences of the 24 learners. The Matrix was used to correlate the results and compare them to the VARK structure, as outlined below in a sample learner's answer.

Q	a	b	c	d	Survey Q	a	b	c	d
1	K	A	R	V	4			c	d
2	R	A	K	V	5		b	c	
3	K	A	R	V	6	a		c	
4	A	R	V	K	7				
5	K	A	R	V	8			c	
6	K	V	R	A	9				d
7	V	A	R	K	10			c	
8	K	V	R	A	11				d
9	K	R	V	A	12			c	
10	A	V	K	R	13			c	
11	K	R	A	V	14			c	
12	R	K	A	V	15				d
13	K	A	V	R	16			c	
14	V	R	A	K	17		b		
15	V	A	R	K	18		b		
16	K	A	V	R	19	a			

Option				
K	A	R	V	
		K		
		R		
		R		A
		R		A
			V	
		K		
	A		V	
	V			
	R			
	A			
K				

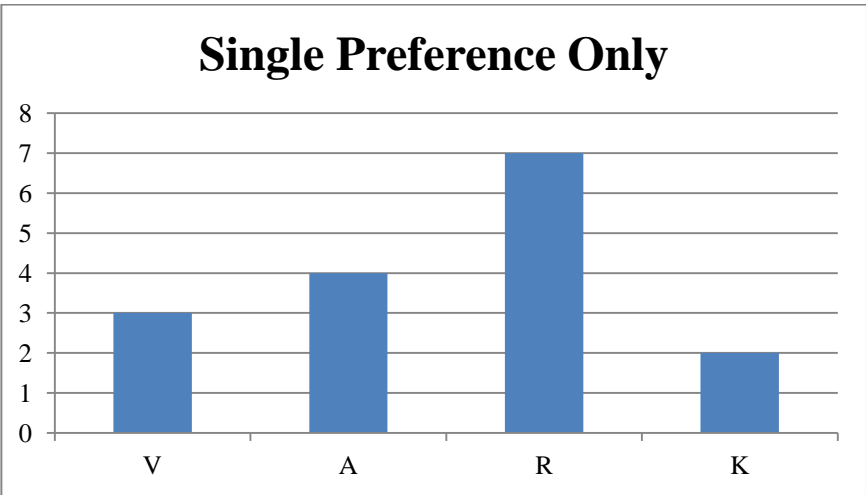
V	A	R	K
4	5	5	4

33% of Learners results showed bimodal tendencies were there were equal scores in two categories. The main Bi-modal grouping was Aural/Reading with 17% of all learners in displaying this modal preference. All the remaining multi modes were equal with 4% each.



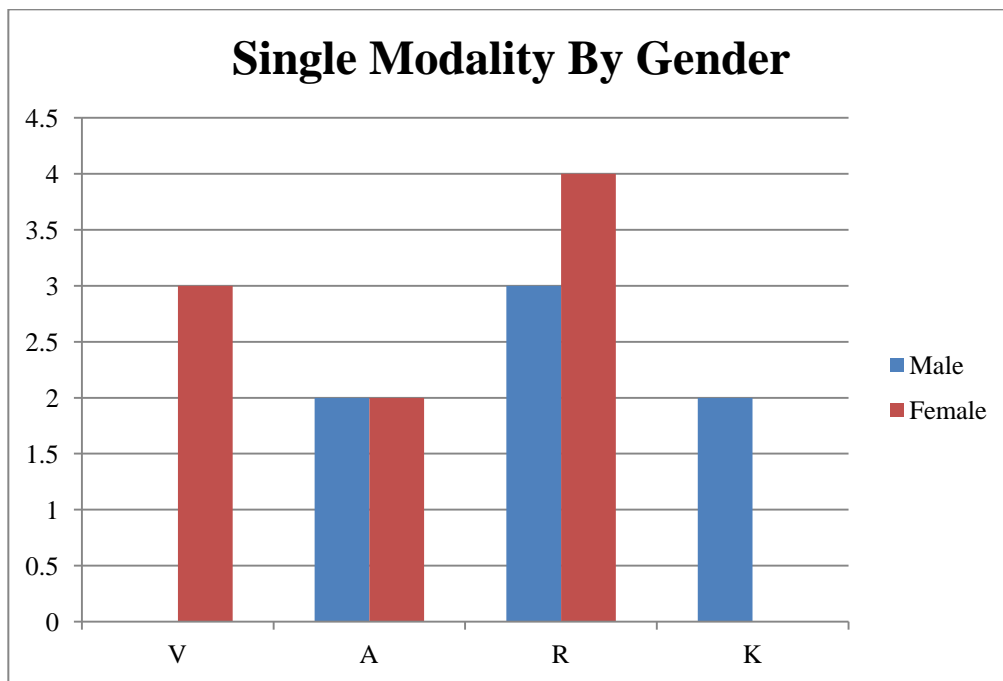
**Figure 9 Bi-modal Groupings**

When these bimodal grouping were removed and the learners with singular modes was examined learners showed a preference for Reading/Writing with 29% of learners displaying this tendency, Aural 17%, Visual 13% and Kinaesthetic 8%.



**Figure 10 Single Preference Only**

### Single Preference based on Gender Profiles



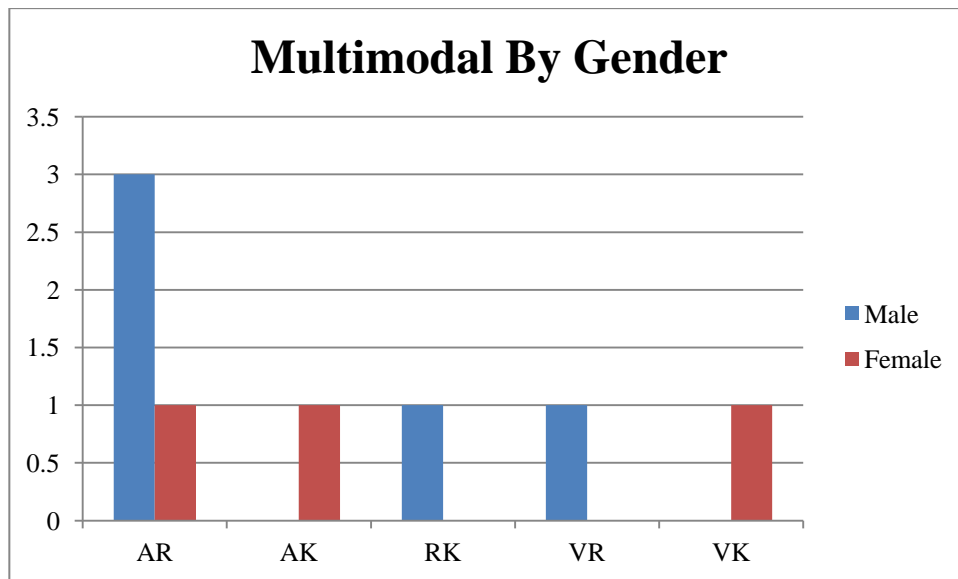
**Figure 11 Single Modality by Gender**

When the Single mode preferences were separated on the Gender divide there were noticeable differences and similarities.

On the Male single preference 25% of all Males showed a Read/Write preference while 17% of all Males were A and 17% were K preferences. Among the Males there were 0 Visual preferences.

33% of all Females surveyed displayed Read/Write as their single preference, while 25% displayed Visual preferences and 8% displayed Aural preferences. There were no Females that displayed Kinaesthetic preferences.

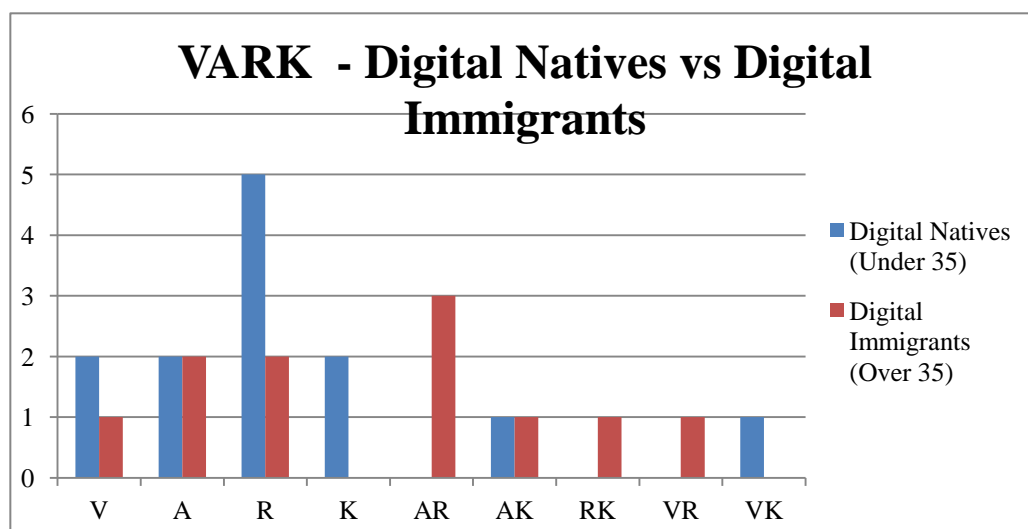
In both genders Read/Write was the largest portion of learners.



**Figure 12 Multimodal by Gender**

On examining those learners with multimodal preferences the males outnumbered the females 62%:38% in the groupings as outlined above.

The following graph represents the divide based on those under 35 (the Digital Native learners) and those over 35 (the Digital Immigrants).



**Figure 13 VARK - Digital Native vs Digital Immigrants**

## **7.2 *The Interviews***

The interviews that were conducted with Tutor 1 and Tutor 2 provided an excellent insight in the mindset of a tutor of Adult Education and the classes that reside in VTOS.

Both tutors had been involved in VTOS adult education for three years, Tutor 2 with Tutor 1 teaching for ten years.

The age groups that attend the classes for both tutors vary from “twenty two to eighty” (Tutor 2) with the majority of students being “between twenty five and fifty” (Tutor 1).

With regard to Digital Immigrant/Digital Native paradigm, Tutor 1 was more aware of the term and concept than Tutor 2 was, so there was a need to explain the terminology. Both tutors definitely placed themselves in the Digital Immigrant sector with (Tutor 1) stating that “Although I don’t feel like an Immigrant, I think I would have to be classified as an Immigrant”. (Tutor 2) stated that “I didn’t grow up with mobile phones or computers in fairness most times we were lucky to have a telly”.

Both tutors classified their students as beginners but they are not completely new to IT because “many would have much more knowledge than they believe themselves to have before they began classes”, and “it’s a matter of working with them through a course content rather than teaching them basic skills”(Tutor 1) and the students “don’t have any qualifications” (Tutor 2).

When asked if they noticed any major differences in the way younger students learn to the way older students learn, Tutor 2 stated that “for older students, there has to be a lot of repetition and they’re more nervous about computers” (ZUR, O. & Zur, A., 2011) Tutor 1 stated that with “the older generation you need to take time and explain the environment, why another window is open how you close it”. Both of the observations of the tutors concurs with (ZUR, O. & Zur, A., 2011) who maintain that Digital Immigrants prefer receiving information slowly, linear, logically and sequentially.



The younger learners in the class however approached the learning concept in a radically different way. As Tutor 1 states “the whole IT environment requires no teaching for the younger generation” and they “almost use it automatically without thinking and without being aware that they are practicing any kind of a skill” as Tutor 2 discovered “a younger person is just going to launch in and try to do it anyway whether they can do it or not”. These again concur with Zur and Zur (ZUR, O. & Zur, A., 2011) again because Digital Natives “to experiment with new technology until we get it right” (WINDHAM, C., 2005)

With reference to sharing ideas in classes Tutor 2 didn’t find any major differences between the two groups. While Tutor 1 noted that “younger people share ideas in smaller groups while older people clarify by asking questions” and sharing with the group. Again these observations concur with the “norms” for Digital Immigrants.

When asked about younger students and their IT ability and their understanding of ICT concepts Tutor 1 stated that younger people “like to move forward fast and they like to pare everything down to exactly what they need to do”. Tutor 2 also stated in a previous answer that “the older generation like to understand everything why it works, why it opens, why it closes”. While Tutor 2 observed that young people “can’t even create folders [eh] and basic little things so, but they’re able to use youtube”.

The next question for both tutors was regarding their teaching technique and to see if they observed any change in their approach to teaching younger students and older students. Both tutors observed that they needed to repeat things and repeat them again “or say something one way and then go to explain it in another way” Tutor 1 also noted that “a slight change of language” was used in order to facility the learning process and older students needed “a bit more one on one”.

Tutor 2 stated with regard to the use of games in the classroom that card games were used to familiarise students with the mouse, while Tutor 1 used games to help students increase speed in typing. Tutor 1 also observed that some students who were “familiar with online gaming but wouldn’t have been taught formally to type” had very high typing speeds already and just needed “familiarity with the keyboard” to improve.

Regarding the use of e-learning tools both tutors have used e-learning tools in the past but not too much and the experience for Tutor 2 was that they “didn’t find it any good”. The use of e-learning tools in the class have been limited to a typing tutor and online ECDL training and Tutor 2 “could see advantages to computer games or whatever but I don’t really think there’s that much relevance when teaching adults”.

Both tutors thought that ICT should be integrated across all classes in the centre “the whole learning experience could be much richer for the use of [em] ICT in every subject” (Tutor 2), but that there also needs to be ICT classes as well.

Web 2.0 received no response as both tutors were unaware of the concept.

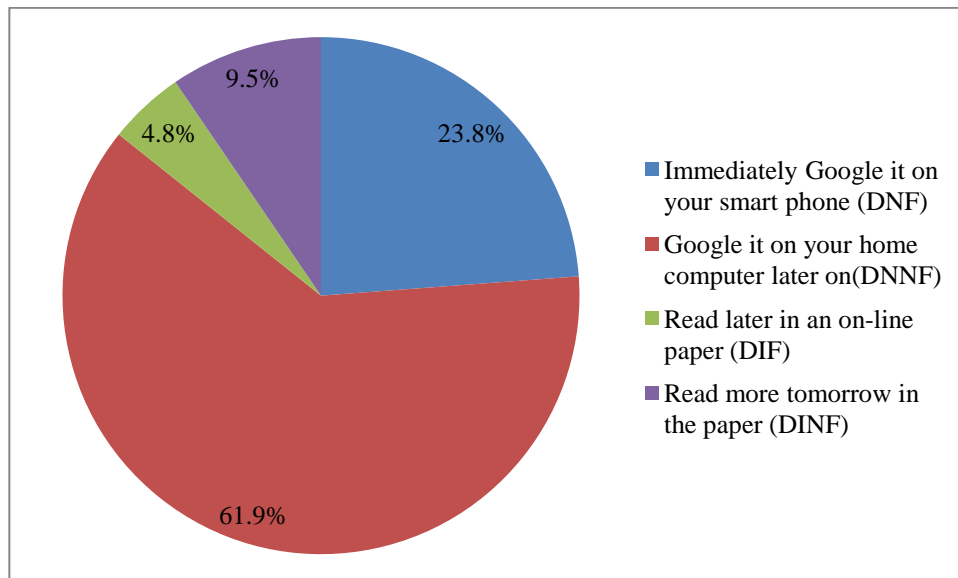
Finally regarding enough resources been given to ICT in the Adult Education sector there was a resounding no, and this was deemed to hinder the “opportunity [for Adults] to go and engage in the society they live in”. “Adults are becoming marginalised people who cannot engage immediately” (Tutor 2). With regard to a wish list of ICT for the classroom both tutors would have liked interactive whiteboards and better PC equipment for students.

### ***7.3 The Digital Native/ Digital Immigrant Fluency Results***

The total number of respondents was 21, 3 did not take this survey. This affected the gender profile slightly with 52% female and 48% male. The age profiles were also affected with 33.3% in the Under 25 age group, 14.3% in the 25-35 age group, 23.8% in the 36-45 age group, 19% in the 46-55 age group and 9.5% in the 56-65 age group.

The age under 35 would be equivalent to Prensky’s Digital Natives being born in the 1980’s and so represents 47.6% of all respondents in this survey.

4 You are watching the News on TV and one of the items is of special interest to you, how would you find out more about it? A staggering 61.9% stated that they would Google the story later. This is well above the Digital Native by age of 47.6%.



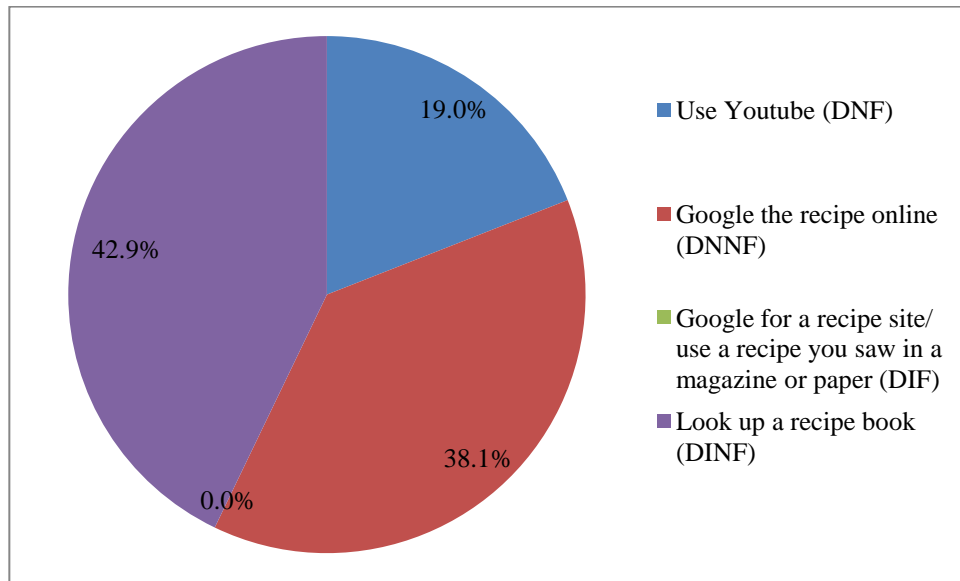
**Figure 14 To Google or Not to Google**

5 You are at an event and a well known celebrity is also attending, which of these options would you choose? The answers here were similar with the exception of only 4.8% taking a photo and emailing it later. Only 23.8% would take the photo and instantly upload to Facebook while show their friend later was 33.3% and tell them later was the highest at 38.1%. Again for a generation of instant always on people only 23.8% would do the upload instantly well below the 47.6% Digital Natives by age.

6 If you are travelling to a new location that you have not travelled to before, how would you prepare for the trip?

The division here was almost exactly the same with 23.8% for using google earth DNF, using a route planner DIF and asking a friend or using a map DINF. Using static Google maps just came out slightly ahead on 28.6%

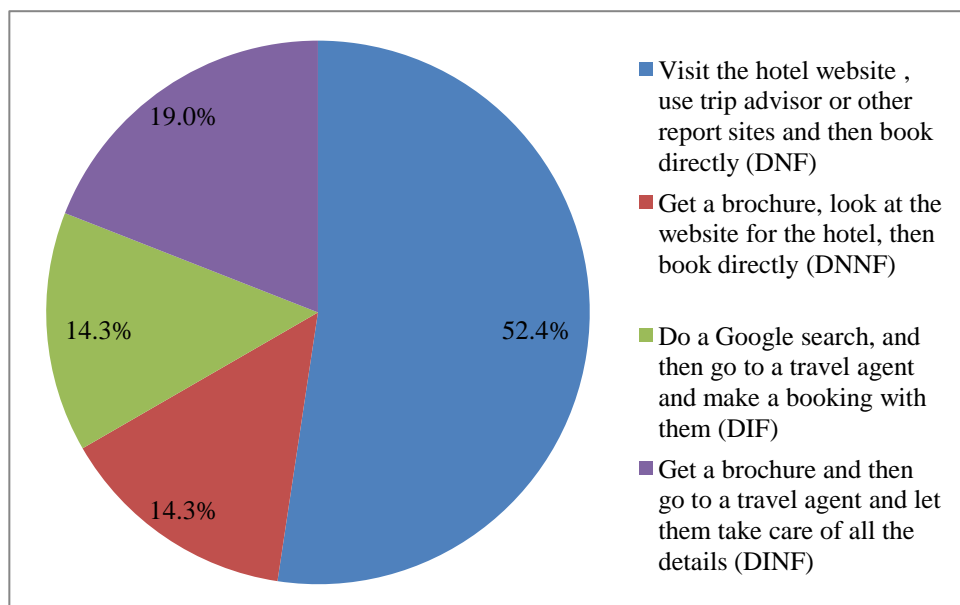
7 You want to get a new recipe for a meal or you are unsure as how to cook the meal, which of the following best describes what you would do?



**Figure 15 Cooking up a Storm DI/DN**

Here the division was strongly in the Digital Immigrant Non Fluent sector with 42.9% of respondents stating that they would simply use a recipe book.

8 Its Holiday Booking time, which of the following options best describes your approach to booking a holiday?

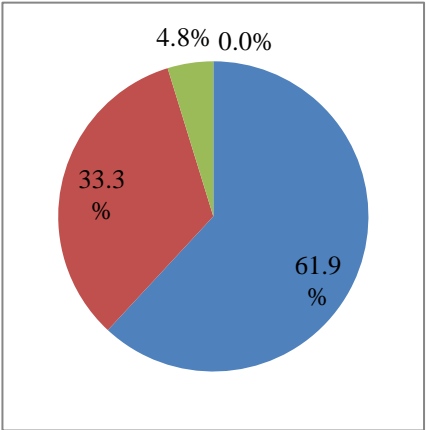


**Figure 16 Book Holidays Online**

A staggering 52.4% of all respondents would search, research, and book their holiday online, definitely Digital Natives. This is above the 47% DN by age

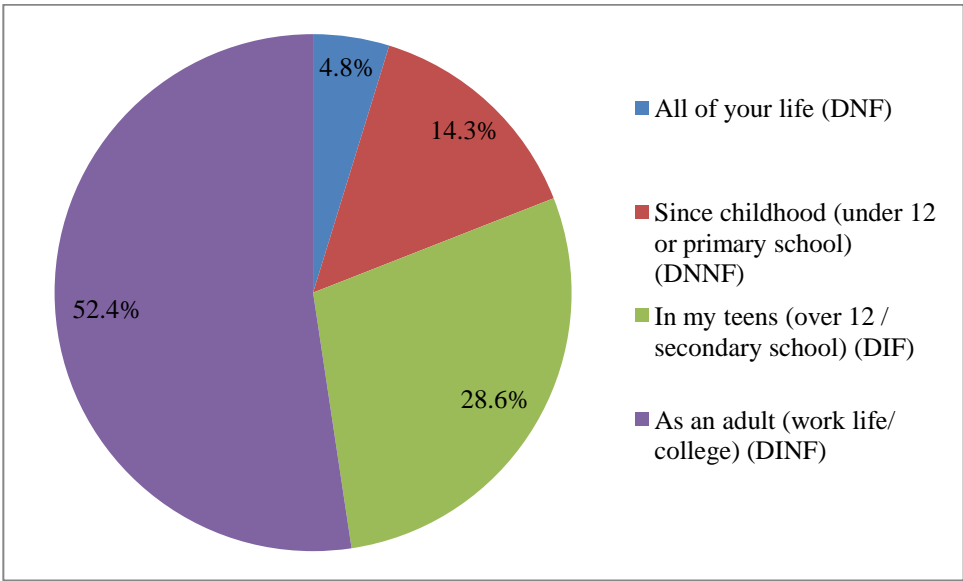
9        You need to check your bank balance what do you do? 71.4% stated that they would just login to their online bank account, while only 4.8% would actually wait to go visit the bank. Again a staggering majority come under the Digital Native banner.

10       An urgent email is needed to be sent, how would you cope with this? 61.9% stated that they would send the email and attachments themselves, while 33.3% would email but would follow up with a call putting them in the Immigrant sector. Only 4.8% said that they would facebook or tweet them, a digital native with less fluency reaction.



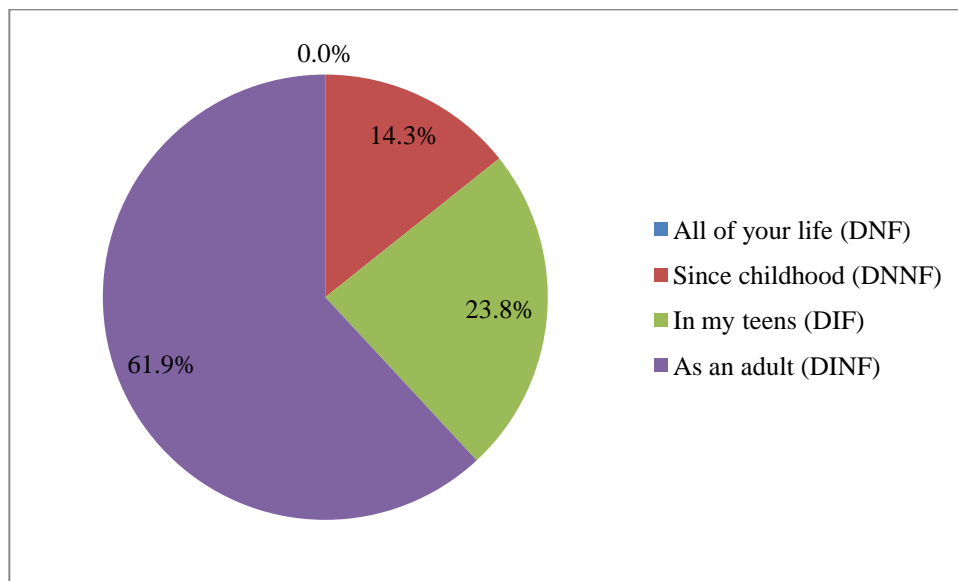
**Figure 17 Email or Tweet DI/DN**

11       How long have you had access to a computer? Only 4.8% of all respondents claim to have had access to IT all their life, while more than half 52.4% have only had access to IT in their adult life. Definitely, Digital Immigrant territory and well below Prensky’s DN accounting for over 47% of respondents.



**Figure 18 Access to IT DI/DN**

12 How long have you had access to the internet?



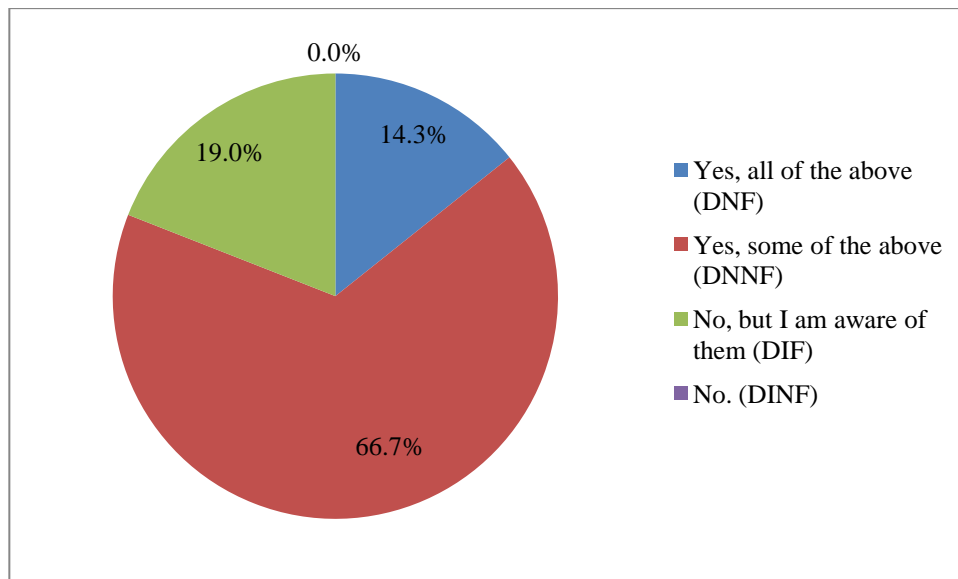
**Figure 19 Internet Access DI/DN**

This time the figure with access to internet all their life drops to zero. 61.9% of all those surveyed only got access to the internet in adulthood. These figures really highlight the slow adoption of Internet in Ireland.

13 You are at work and you have to photocopy double sided, 57.1% stated that they would simply do it themselves and 33.3% stated that they would somebody to show them how to do it.

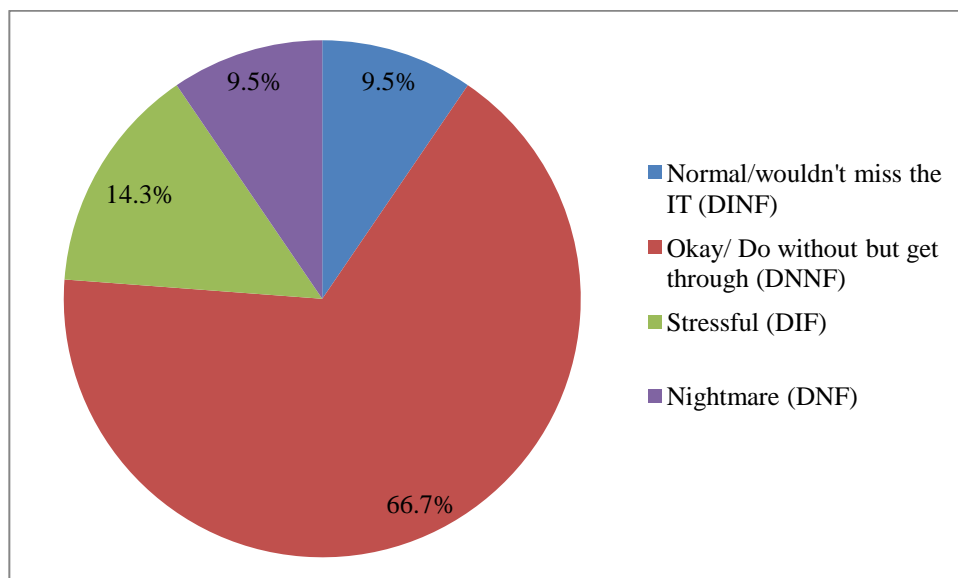
14 You are about to buy a book, 52.4% would go to their local bookstore while 42.9% would order it online and wait. Only 4.8% displayed the need for instant gratification and would download to their e-reader.

15 Have you ever used a blog, wiki, social networking site or microblogging services? 66.7% of respondents have used some form of online social media network, while 19% have used none.



**Figure 20 Blog, Wiki and Social Networking Sites**

16 If there was no mobile phone or internet for a day due to power problems, how would a day without technology feel? Interestingly 66.7% of those surveyed stated that they would get through a day without phones or internet. 9.5% said that the day would be normal and a further 9.5% said it would be a nightmare! The Digital Native according to Prensky lives their life totally submersed in technology so a day without technology would seem to be unbearable but 66.7% stated it would be OK. DN 47.6% by age categorisation.



**Figure 21 No Connectivity - Nightmare or Normal, DI/DN**

17 If you are sending a text message which of the following best describes what you type?

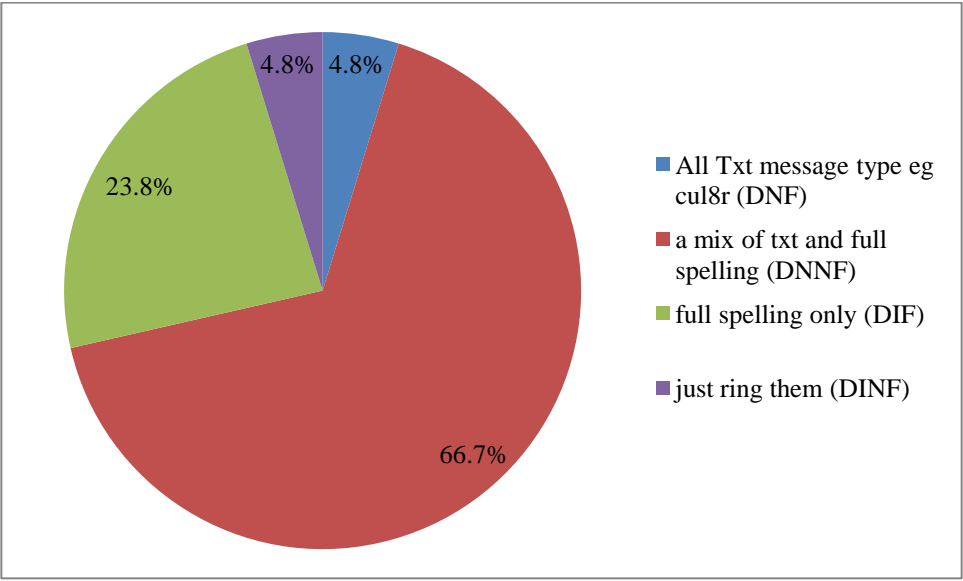


Figure 22 Text or English

Only 4.8% stated that they would use all text type, while 66.7% said that they would use full spelling only.

18 You need to remind yourself of an important appointment, what do you do?

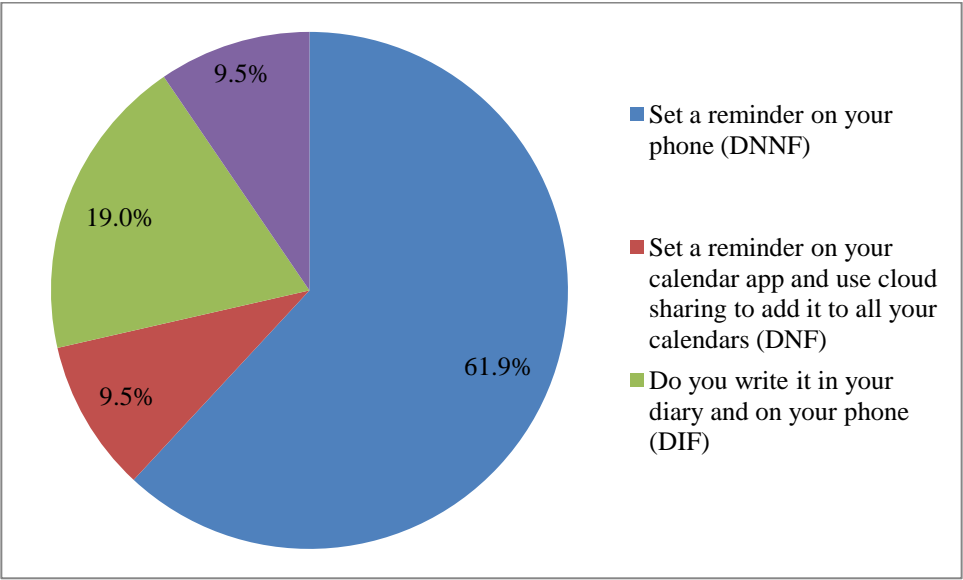


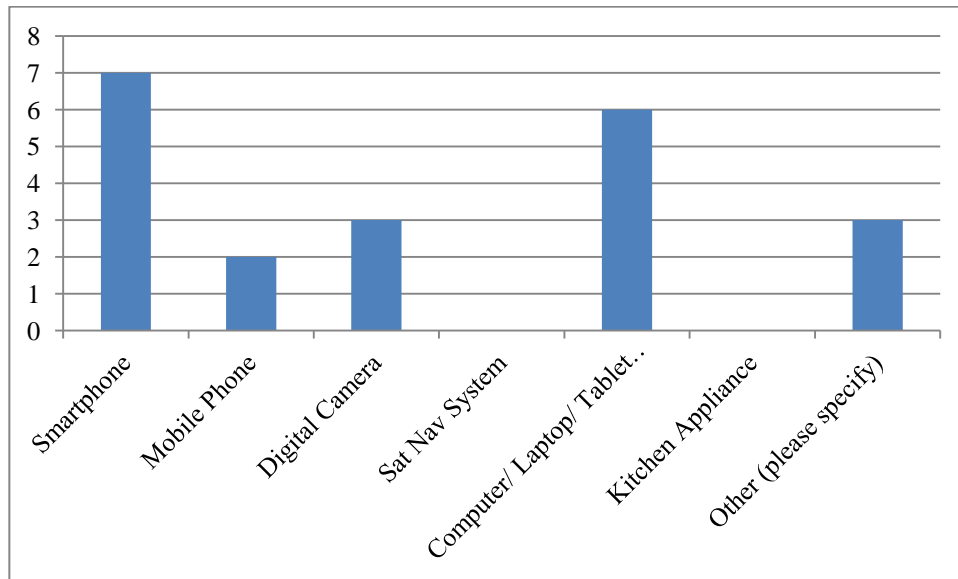
Figure 23 Reminders! DI/DN



19 How much do you spend annually (approx) on new technology?

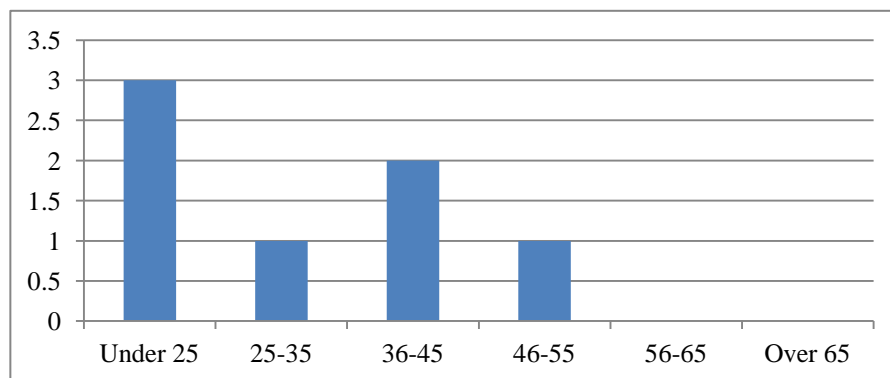
42.9% spent between €101 and €250 annually on new technology, with a further 33.3% spending between €251 and €500. 4.8% spend less than €50 and 19% spent between €50 and €100. Nobody spent over €500 per annum on Technology

20 What was the latest piece of technology that you bought?



**Figure 24 Technology Purchases DI/DN**

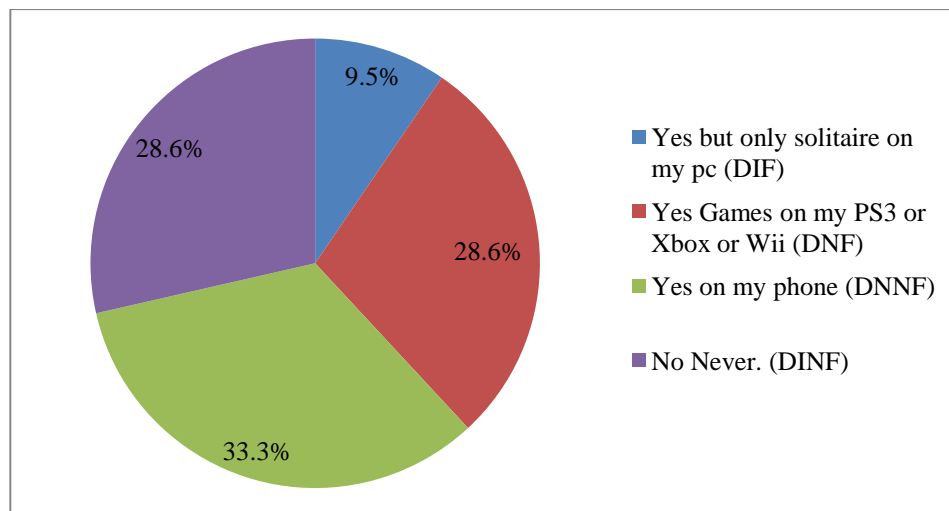
The Smartphone is the winner at 33.3% just ahead of the computer, laptop, tablet group at 28.6%. The purchases of the mobile phone were made by one digital immigrant (by age) one in the 56-65 age group and by one in the 25-35 borderline Digital Native. The other items of technology that were purchased were an iPod touch, a printer and a slow cooker. The Smartphone purchases as listed below show a bigger proportion of purchases in the under 25 age group.



**Figure 25 Smartphone Purchases by Age**

21 Have you ever bought a product on line? (only 20 answers were received)  
52.4% claimed that they bough products regularly on line while 14.3% had never purchased anything online.

22 Do you play computer games? Prenskey has always maintained that the Digital Native live their lives through games and through game experiences.



**Figure 26 Game Play DI/DN**

XBOX, PS3 or Wii Game Play

Age Group	Count	Male	Female
Under 25	4	2	2
25-35			
36-45	2	2	

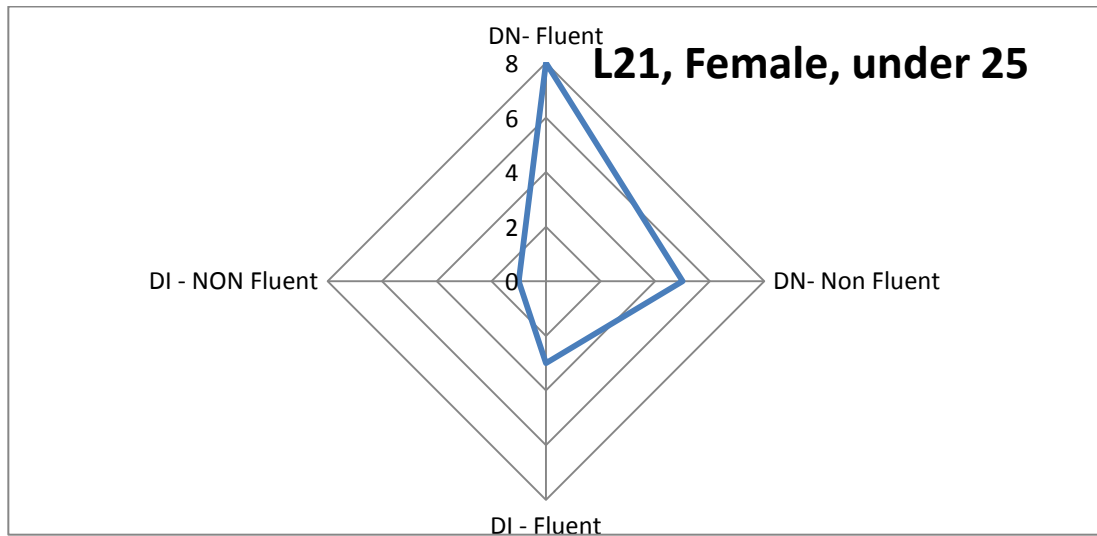
The age grouping shows predominance in the under 25 age group with equal males and females partaking in game play. At the older age grouping of 36-45 it is only males who are involved in game play.

From the learners that never play computer games

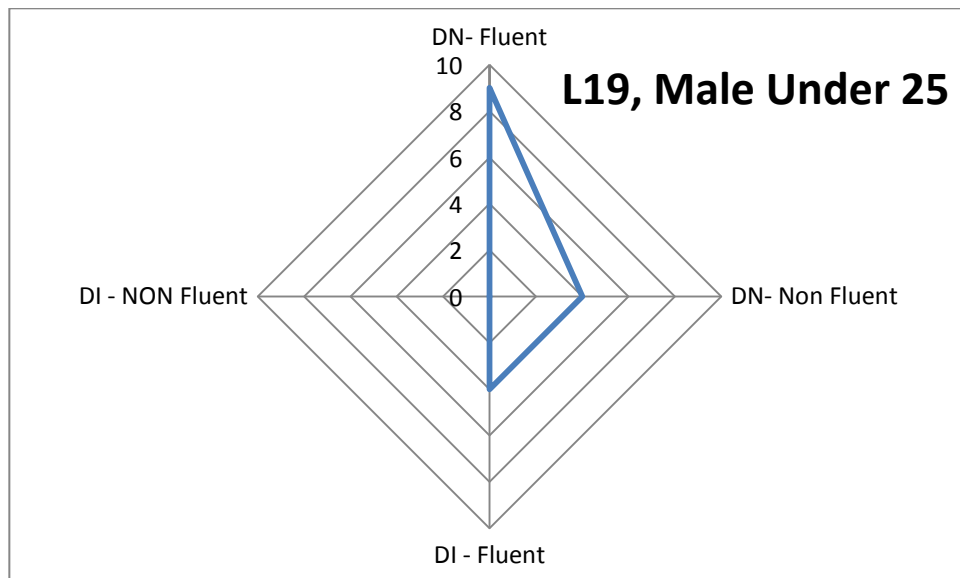
Age Group	Count	Male	Female
25-35	1		1
36-45	2		2
46-55	2	2	
56-65	1	1	

The non game playing learners showed a mixed result with more males in the 46-55 and 55-65 age groups while more non game playing females were in the 36-45 group.

Below are the graphs of some of the respondent's scores, a male and female from each age category has been graphed to show Digital Native, Digital Immigrant tendencies. Under 25s



**Figure 27 Learner 21, Female, Under 25 Age Group DI/DN Chart**



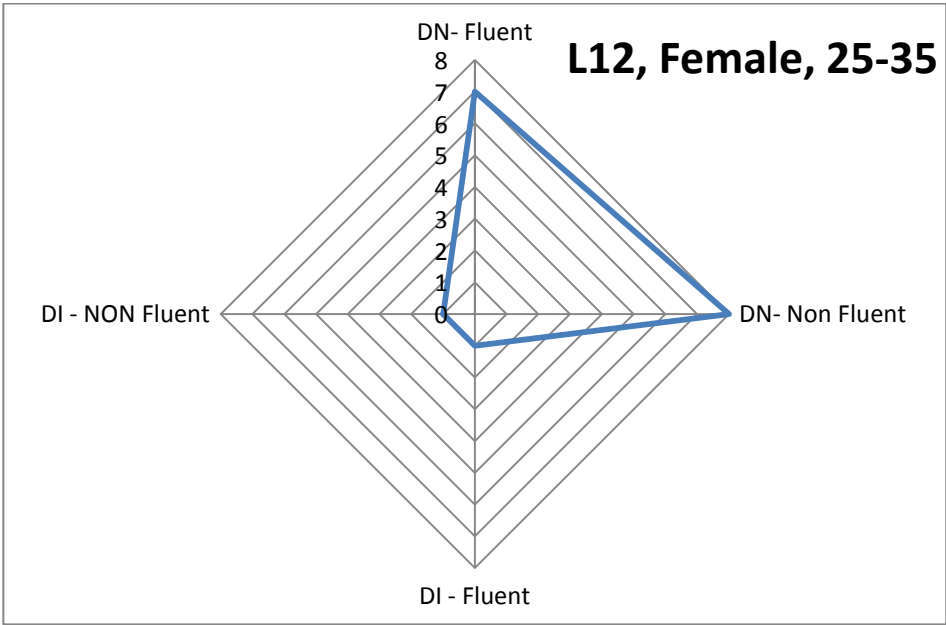
**Figure 28 Learner 19, Male, Under 25 Age Group DI/DN Chart**

Both examples above one female and one male of under 25 show predominantly a high score of 8 and 9 respectively in the Digital Native- Fluent and a lower score in the

Digital Native – Non Fluent sector, while both learners show a very low score of 1 and 0 in the Digital Immigrant Non Fluent sector.

25-35 age category

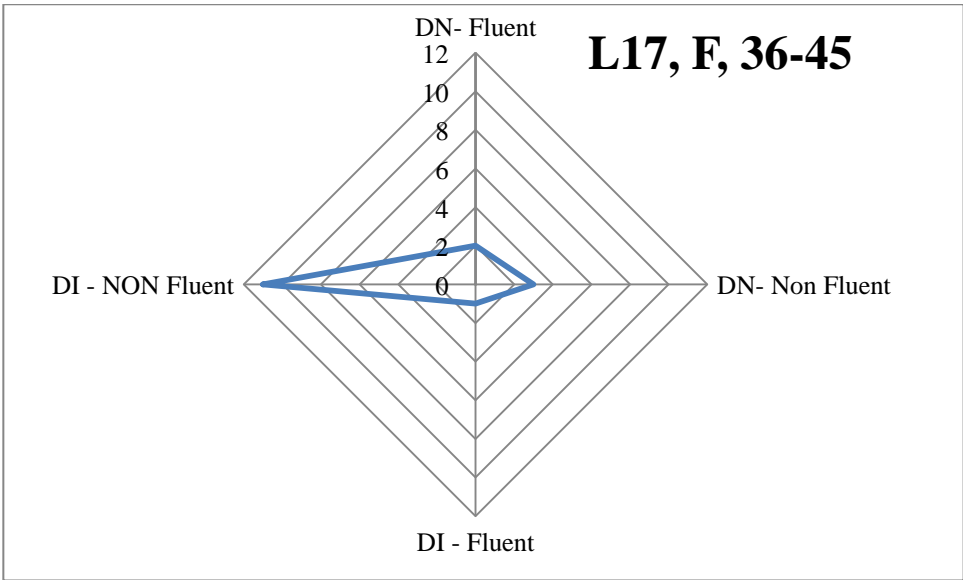
There were no male respondents in the 25-35 age category



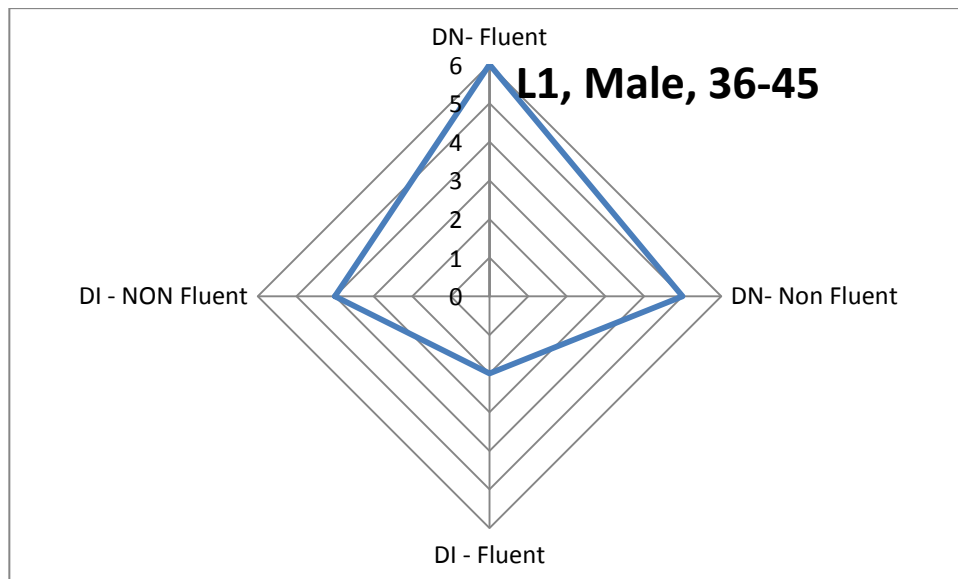
**Figure 29 Learner 12, Female, 25-35 Age Group DI/DN Chart**

The female showed high digital native tendencies with a very low score in the digital immigrant sectors.

36-45 Age Category

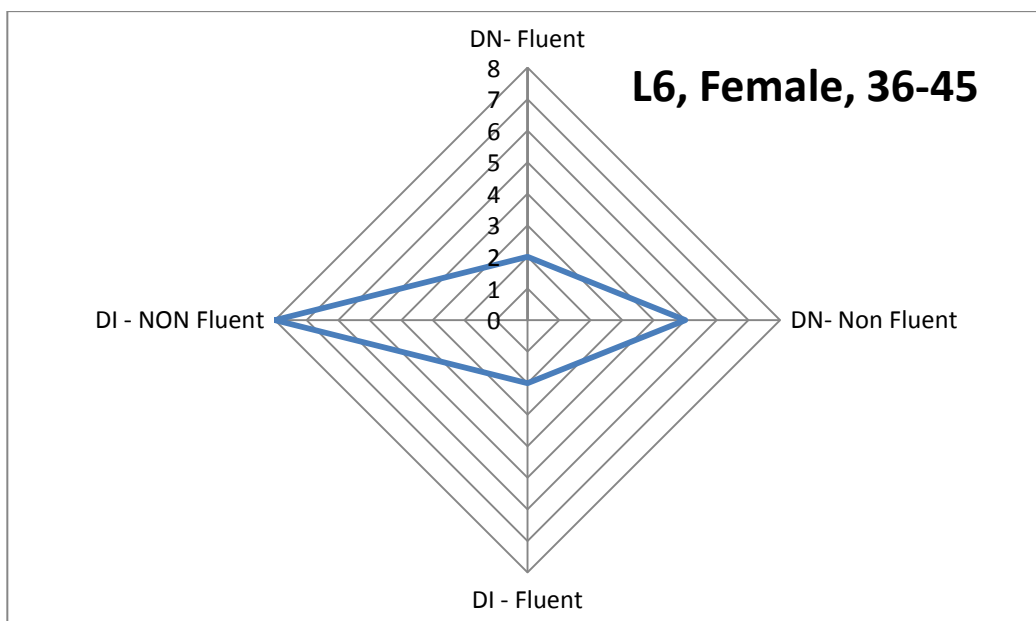


**Figure 30 Learner 17, Female 36-45 Age Group DI/DN Chart**



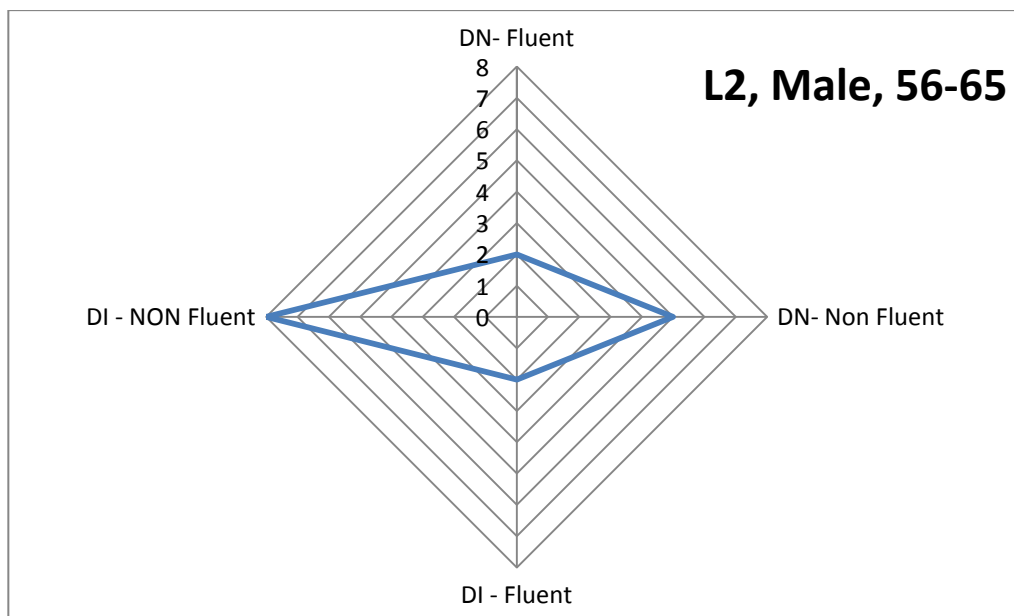
**Figure 31 Learner 1, Male, 36-45 Age Group DI/DN Chart**

In the above examples the male shows predominantly higher scores in the digital native sectors while the female score is predominantly DI with no fluency.

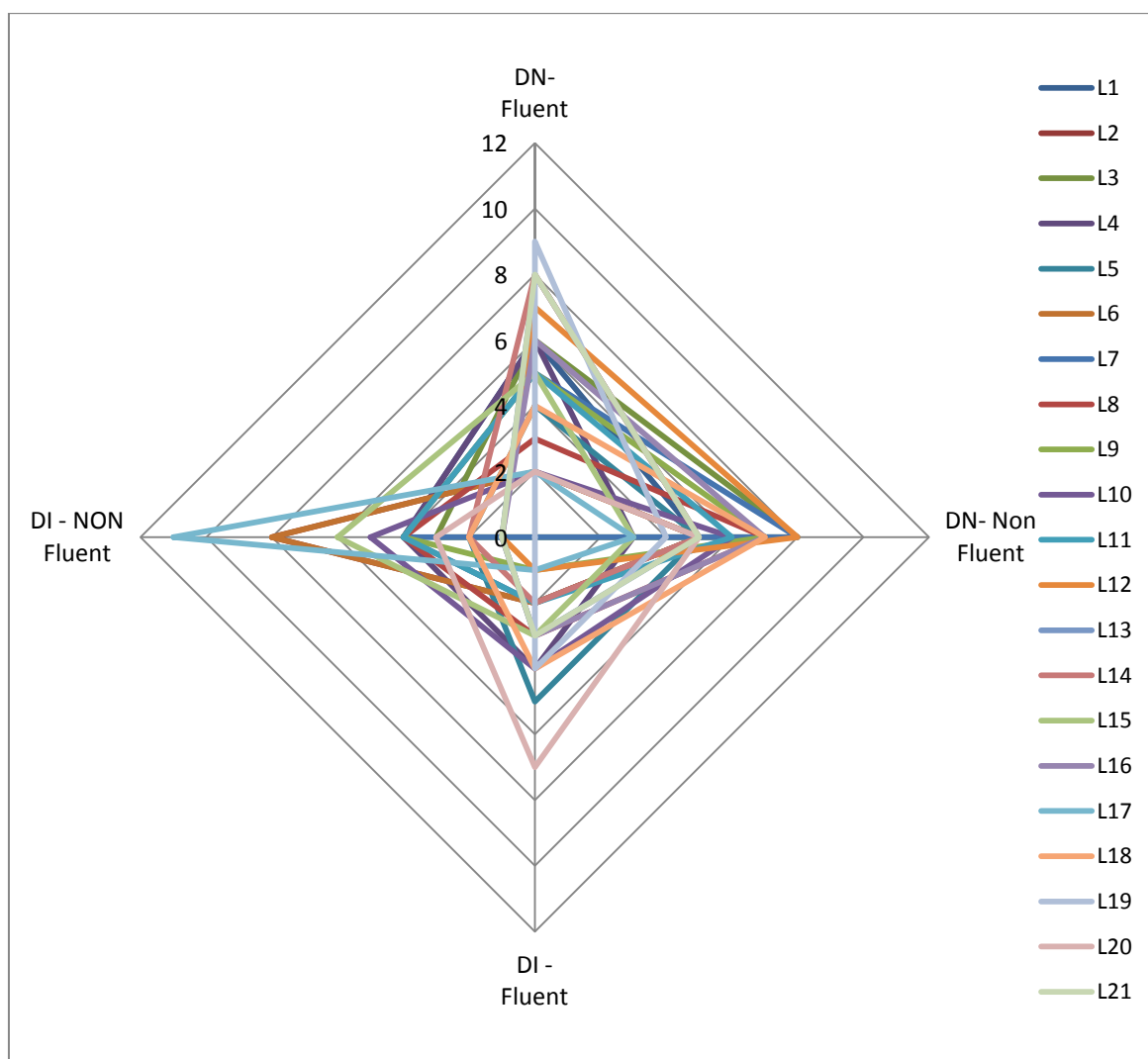


**Figure 32 Learner 6, Female, 36-45 Age Group DI/DN Chart**

In the above example above and below both male and female show predominantly Digital Immigrant Non Fluent scores while scoring low in all fluency sectors.



**Figure 33 Learner 2, Male, 56-65 Age Group DI/DN Chart**



**Figure 34 DI/DN Score for all respondents**

# Overall results from Digital Native/ Digital Immigrant Questionnaire

	Gender		Age Categories						DN	DI	DN - Fluent	DN - Non Fluent	DI - Fluent	DI - NON Fluent	
	Female	Male	Under 25	25 - 35	36 - 45	46 - 55	56 - 65	Over 65							
L1		1			1					DI	6	5	2	4	L1
L2		1					1			DI	2	5	2	8	L2
L3		1				1				DI	6	8	0	3	L3
L4		1	1						DN		5	3	4	4	L4
L5	1		1						DN		4	5	5	2	L5
L6	1				1					DI	2	5	2	8	L6
L7		1				1				DI	5	8	0	4	L7
L8	1			1					DN		3	7	3	4	L8
L9	1				1					DI	5	7	1	4	L9
L10		1			1					DI	2	6	4	5	L10
L11	1					1				DI	5	6	2	4	L11
L12	1			1					DN		7	8	1	1	L12
L13	1		1						DN		8	5	3	1	L13
L14		1					1			DI	8	5	2	2	L14
L15		1				1				DI	5	3	3	6	L15
L16	1		1						DN		6	7	3	1	L16
L17	1				1					DI	2	3	1	11	L17
L18	1			1					DN		4	7	4	2	L18
L19		1	1						DN		9	4	4	0	L19
L20		1	1						DN		2	5	7	3	L20
L21	1		1						DN		8	5	3	1	L21

Count	11	10	7	3	5	4	2	0
-------	----	----	---	---	---	---	---	---

DN –under the age of 35, DI over the age of 35

**Table 11 Overall results from DI/DN Questionnaire**

#### ***7.4 The results from the E-Learning survey.***

A total of 20 learners took part in this survey. The Group Profile for gender was split 50:50.

In response to question 4 regarding the previous use of e-learning tools and 40% had not, while 10% were unsure.

With regard to the types of e-learning tools that they had used previously the following answers were provided

Typing Tutors	2
Online tutorials in office applications	3
Chemistry and Biology on Maynooths Moodle	1
Business & ICT	1
Using explanatory videos to help study for leaving cert	1

6 Again if you answered YES how would you describe your experience?

- great , very informative and clarifying
- Enjoyable and worthwhile
- Found it difficult to follow as speaker had American accent, and I could not follow some of what he was saying
- Enjoyed the course
- difficult
- Positive experience which allowed me to hear an explanation as many times as I needed which I found helpful
- practical efficient way to learn new skills

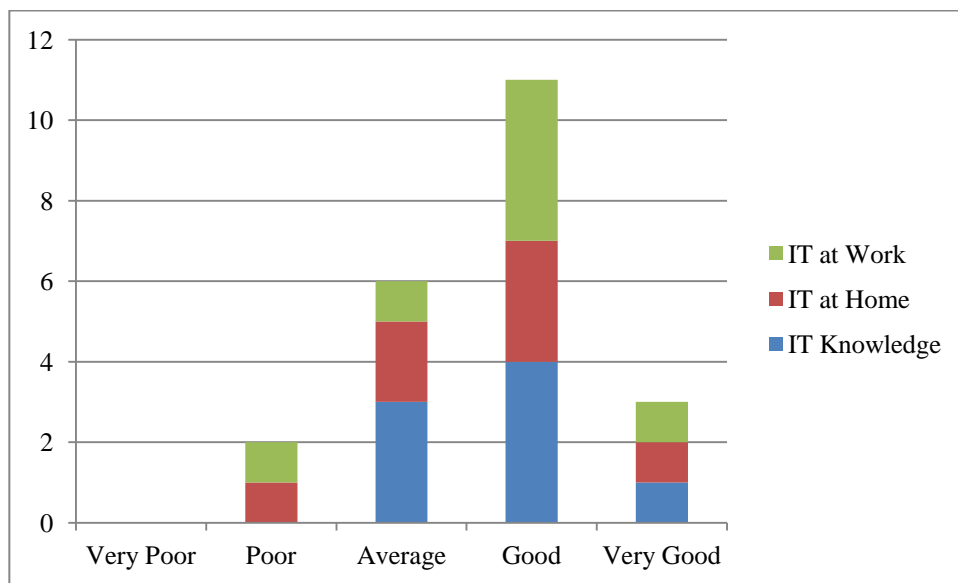
There was a split between enjoyable and difficult but 85.7% said that the experience was mostly positive.

For those learners who had not used e-learning tools before 75% said that there was no opportunity to use them. 25% stated that they saw a demonstration but did not use them personally.



When the learners were asked to rate their own IT knowledge 37.5% selected Average, 50% selected Good and only 12.5% selected Very Good. Following on from their knowledge they were asked to rate their It usage at home, 14.3% stated that their use at home was Poor, 28.6% - Average, 42.9% - Good and 14.3% selected Very Good. Their work use of IT, were similar with Poor, Average and Very Good each scoring 14.3%. 57.1% stated that their use of IT at work was Good.

Below is a combined chart showing the learners perceived knowledge of IT and their use of IT at home and at work.



**Figure 35 Learners Use at Home and at Work**

When asked to rate their companies training of IT in any previous career only one third 33.3% said it was good while two thirds selected poor or very poor (one third each).

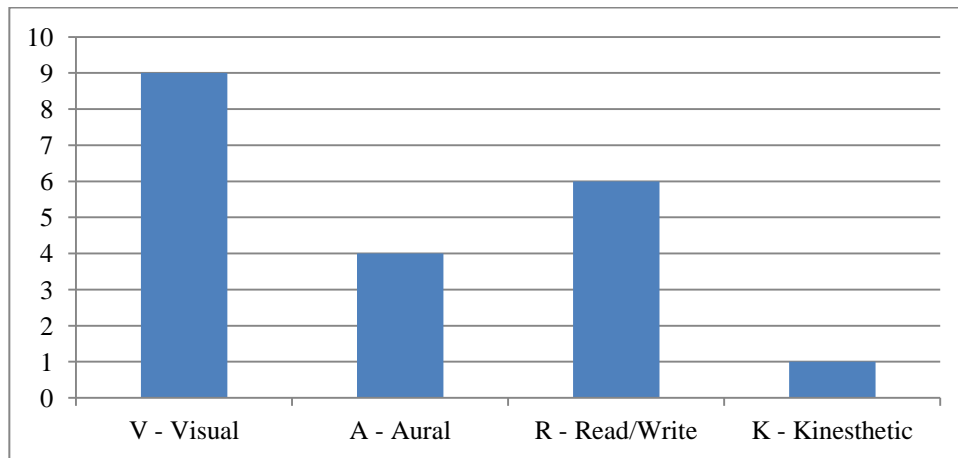
Now onto the VARK Styles

### 13 Main VARK Mode

There were 5 Learners who were multimodal in the categories AK 1, AR 3 and VR 1. In reference to single modes there were 8 in the R mode, 5 in the V mode, and 2 in the A mode. There were no learners in the K mode.

When learners were asked to select a mode other than their main preference the following answers were received

The learners were asked to undertake the exercises in their non main mode and 45% selected V, 20% selected A, 30% selected R, and 5% selected K.



**Figure 36 Alternative VARK Mode chosen**

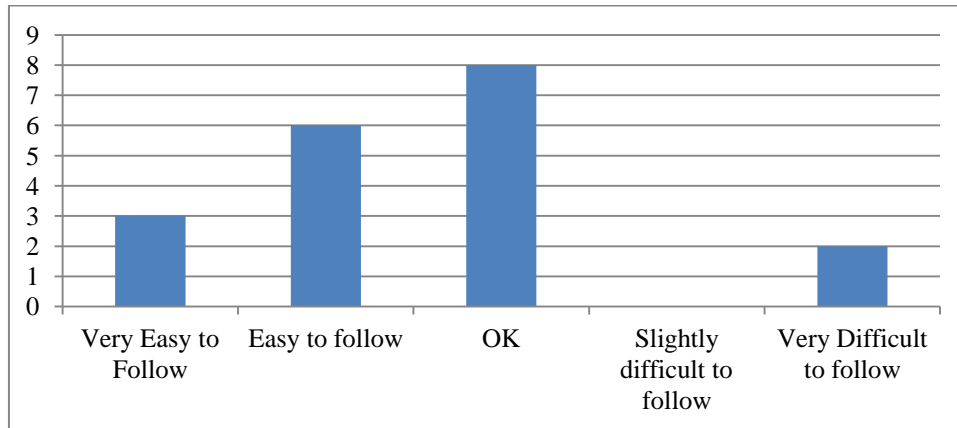
Some of the reasons given for choosing the alternative mode are as follows

V	A	R	K	Why?	DI/DN
			K	I thought it would be an interesting one to choose	DN
V				always liked to see/view how objects are made /repaired	DI
V				Learn off diagrams better	DN
V				i can learn easier when seeing an example in front of me	DI
		R		I like reading instructions	DN
V				visualise the tutorial as a powerpoint.	DI
		R		I like to write down material and then read it back in my own time. I can take notes for further research.	DI
		R		I feel that reading something makes you absorb it better	DN
	A			I find listening to be my next strong point after reading and writing	DN
V				think is is easy if I see something im used to looking at hard copies or notice boards( <i>sic.</i> )	DI
	A			I felt it would be my next best form of learning	DI
	A				DN
		R		Because I thought written instructions would be easy to follow	DI
		R		I also find this method beneficial to me	DN
V				I was curious about Aural outcome and believed myself to be a visual learner.	DI

**Table 12 The Responses for choosing Alternative Mode**

The DN/DI column shows the represented age of the respondents based on Mark Prensky definition (PRENSKY, Marc, 2001). If they are under 35 they are deemed Digital Natives and over 35 are considered Digital Immigrants.

The learners was asked to rate their experience of their non main mode as a means of learning



**Figure 37 Experience of Non Main Mode**

The results from this question showed that 89.5% of respondents found using their non preferred mode of learning to be Ok, Easy or Very Easy, with only 10.5% showing that their non preferred mode was very difficult to follow. The reasons given are listed below.

Very Easy to Follow	Easy to follow	OK	Slightly difficult to follow	Very Difficult to follow	Why?	DI/ DN
1					I thought how each step was laid out that i was able to understand it very well, especially the Audio.	DN
	1				i chose easy to follow because the first time i couldnt follow it then i tried the second time and realised it was easy enough. ( <i>sic.</i> )	DN
				1		DI
		1			had to re-read instruction and examine formula shown	DI
						DN
		1			Pictures moved a bit too fast	DN
		1			fairly simple to follow, some of it was a bit quick	DI
	1				As I am comfortable with spreadsheet IF functions it was easy to follow	DN
	1				before e-learning visual powerpoint lessons are the normal way of taking in a lesson. ( <i>sic.</i> )	DI
	1				I like to visualise mathematical equations etc. as it helps in the learning process.	DI
	1				It was easy to follow because the guidelines were very simple and easy to use	DN
		1			I didnt really know how to follow it, but after having a good look I soon got into it( <i>sic.</i> )	DN

		1			very different type of learning for me	DI
		1			Step by step instructions	DI
		1			When speaking about building the formula you did not say to put the () in on the OR example, you did say it later.	DI
				1	took a while to open and find what i was to do	DN
		1			takes a while for the formula to sink in	DI
	1				I found the instructions and examples given were explained clearly	DI
1					Everything was laid out neatly and clearly in designated sections relating to the main topic	DN
1					Clear and logical illustrations.	DI

**Table 13 Reasons for Rating Non Main Mode**

The follow on question inquired if there was anything that would have helped to make the experience better. There were 16 responses.

A voice over explanation to reinforce the visual display
be less tired
Better internet access, as i was getting frustrated
I found the learning experience fine as it was
I was happy with everything
I wish i had prior/grown up with the computer generation.
I would have liked that but it was a good learning experience
If the diagrams moved a little slower
More use of text books or written material that we could bring home and practise on in our own time would probably have helped.
somebody talking through what was happening
Text spread over more pages
The ability to practice each formula as I played the video
think i wouldnt be afraid of this type of learning in future
Visual
With audio I could stop and go back on the exercise.
writing or typing in the formula as i read the question

**Table 14 Improvements for non Main Mode**

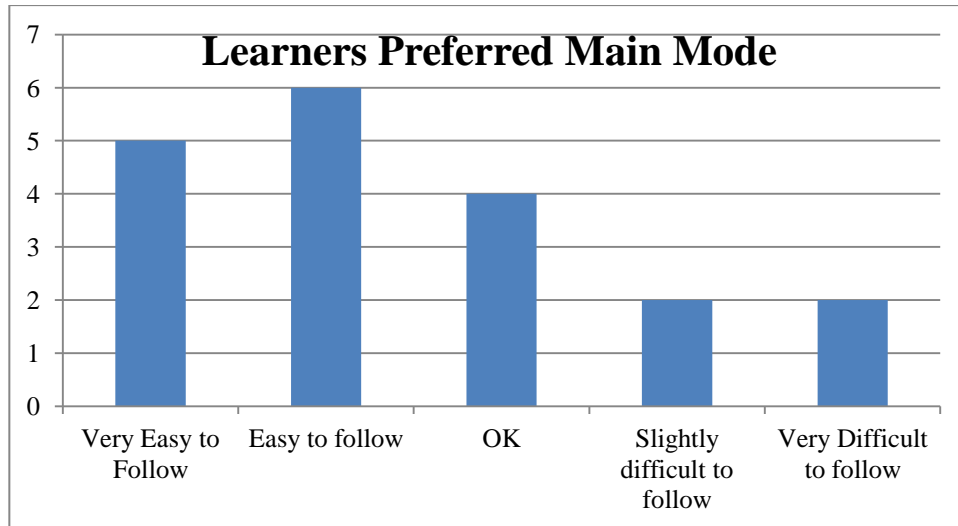
The opposing question regarding what hindered your experience was then asked. 5 of those responded stated that nothing hindered them. Of the remaining responses here are their answers

A large quantity of text in the same space seemed slightly off putting at first
Access to computers
Better internet access, as i was getting frustrated
lack of writing or typing in the formula as i read the question
lateness of time
My ability to take in information on the first tutorial still needed more time played over

again.
my own confidence I found myself moving at a slower pace
On Visual the exercise moved to quick to understand the logic of the diagram. ( <i>sic.</i> )
The ability to practice each formula as I played the video

**Table 15 Reasons of Hindering Learning**

On the learners preferred mode of learning



**Figure 38 Learners Using their Preferred Mode in E-Learning**

The reasons for their experience rating some learners provided no reasons.

Very Easy to Follow	Easy to follow	OK	Slightly difficult to follow	Very Difficult to follow	Why?	DI/DN
1					I was happy with everything	DN
	1				im not sure	DN
		1			being less tired	DI
			1		being better layed out( <i>sic.</i> )	DI
	1				More spacing in the text and maybe some highlighting of certain instructions	DN
		1			Better understanding of computer applications.	DI
1					If the visual was incorporated with the reading/writing in the whole teaching experience would have been very helpful...ie a few diagrams along with the text	DI
	1				I had no cofident when I started this type of learning( <i>sic.</i> )	DI
		1			Diagram to cluttered and to quick	DI
1					typing in and practising the if statement	DI
1					I found everything fine as it was	DI
			1		Visuals	DI

**Table 16 Experience Rating Reasons**

When asked if anything had hindered their learning experience the following statements were received. A total of 12 responses were received of which 4 stated that nothing hindered their learning experience

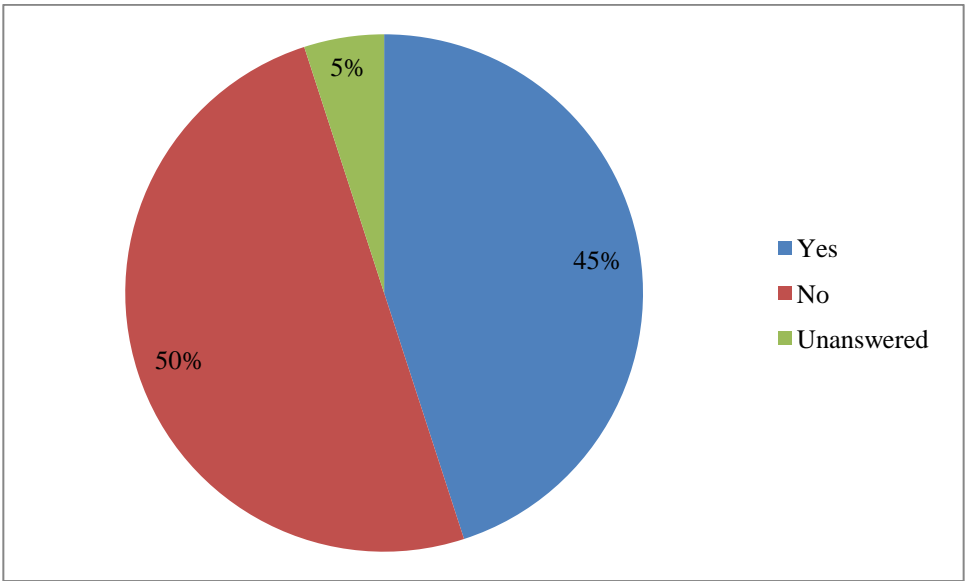
- Having to pause the player to type in spreadsheet.
- I was slightly afraid of this type of learning but feel that I wouldn't be afraid if I had to in the future (*sic.*)
- im not sure (*sic.*)
- lack of typing in and practising the if statement
- lateness of night
- Make diagram larger and slower
- too much writing, no structure
- Would like to have had more computer experience over a number of years.

The learners were then asked which mode they found to be the most helpful

Main Mode		Which was most helpful	Same as Preferred Mode	Reason for this preference
AR	L1	Aural	Yes	I thought how Stephen explained every detail word for word was exactly how I like to be taught, so that i dont miss anything.
R	L2	Visual	No	it was easy to follow.
RK	L3	Visual	No	?
AR	L4	Read/Write	Yes	my strong point or personality type
A	L5			
R	L6	Read/Write	Yes	Easier to follow the steps rather than follow the video
R	L7	Visual	No	easier tom learn when you see something happening in front of you
V	L8	Visual	Yes	The visual display showed me what to do quicker than the reading of instructions
AR	L9	Visual	No	When a statement is displayed can be followed taken down in note form.
V	L10	Read/Write	No	Easier to understand
R	L11	Read/Write	Yes	I enjoy reading
R	L12	Read/Write	Yes	Easier for me to follow
AR	L13	Aural	Yes	It appealed to me as I taught it would be easy as i expected that I would hear all instructions
A	L14	Visual	No	
VR	L15	Aural	No	I could stop and restart easily until I could understand the formula
A	L16	Read/Write	No	
R	L17	Read/Write	Yes	clear and precise instructions
AK	L18	Aural	Yes	I thought the Aural instructions were very clear and told you exactly what you had to do and what cells everything should be in
V	L19	Read/Write	No	All information was there when I need it and I could go back and check again at any time of I misunderstood
A	L20	Visual	No	I believed this to be my preferred( <i>sic.</i> ) learning style

**Table 17 VARK Preferred Mode vs Learner Preferred Mode**

When these most helpful results were compared with the learner’s actual preferred mode 45% stated that it did help while 50% stated that it didn’t help. 5% did not answer the question.

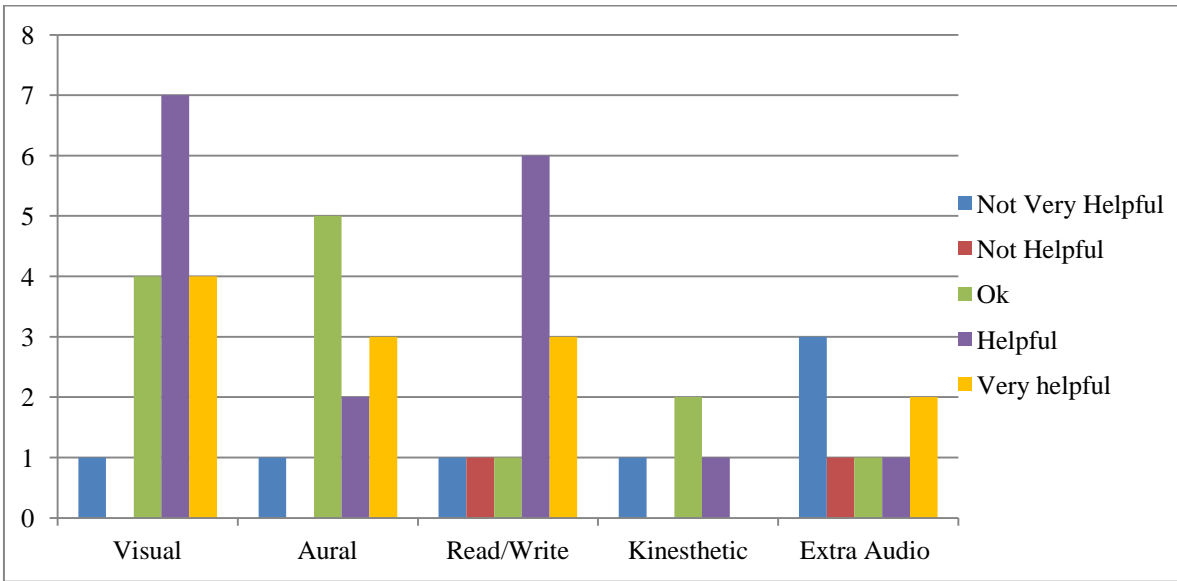


**Figure 39 Preferred VARK Mode versus most helpful mode**

This result shows that 50% of those surveyed stated that their VARK questionnaire preferred mode was not the mode they found most helpful to complete the e-learning exercise.

There then followed some general questions on the learners experience regarding the modes and the exercises that they encountered in the experiment.

The rating scheme was used again



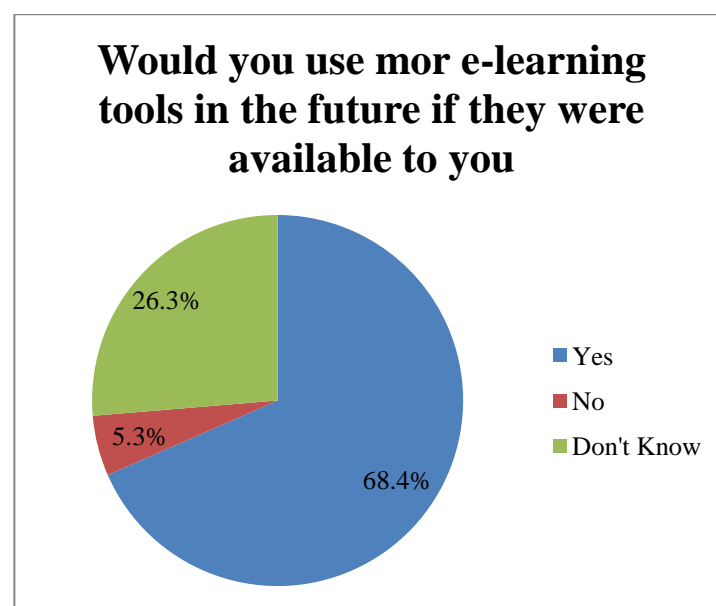
The next couple of questions were centred on the learner's learning preferences with regard to the way in which they perceive that they work best, whether they prefer to have a tutor present or not? A high 42.1% of respondents stated that they preferred to work by themselves in class while only 21.1% stated that they preferred to have a tutor present during their learning. 36.1% stated that they worked best in twos, while only 5.3% said that they worked best in small groups.

Even though just over 20% of learners like to work with a tutor, 60.9% stated that they would like to have a tutor explaining lessons to them.

When asked if they would have liked to have more tutor support in completing the e-learning task almost 58% said No.

Overall most students were happy with the services they received on their present course, with the most notable show of discontent being at the quality of computer and the availability of computers outside class time.

The students were then asked if they would use e-learning tools again and a resounding 68.4% stated that they would be interested in using e-learning tools again. Just over a quarter of those surveyed 26.35 were unsure whether they would use e-learning tools again. 5.3% stated that they would not use e-learning tools in the future.



**Figure 40 Would you use e-learning tools in the future?**



The reasons given for using e-learning tools in the future

- I think if I had something there that was able to help me with something I was finding difficult, that I would definatly(*sic.*) use it.
- tried to purchase dvd on database
- Very helpful
- would be nice to have available in your own time
- I have used many e-learning tools in the past and I plan on using them in the future if available to me as I feel it is a great way of learning
- very helpful as a study aid - to go over class work and replay tudors explaining something difficult help practice and grasping of the material matter
- e learning toos(*sic.*) would be a good backup to any course
- with the current speed of new IT equipment, e learning is the fastest way of keeping ahead of the latest devices
- As technology advances the quality of learning tools also advances. I find they are extremely helpful And improving all the time.
- They are usefull(*sic.*) tools to reinforce learning, practice new skills.

The response from those who were unsure about using e-learning tools into the future

- Unsure if e learnining(*sic.*) can replace human tutors? Will e learning provide instant correction of mistakes?
- I really don't know
- Not sure as it seems like a good way to learn but when you haven't seen anything like this before it would put you off
- I found this quiet interesting but in a classroom environment I would prefer learning with a tutor as I think with E learning you would have to be very disciplined

The responses showed an underlying fear of losing the human interaction and all responses were from learners who could be categorised as Digital Immigrants.

The final question on the survey was very retrospective in that it asked students for one thing that they could have done to improve their PC learning on the course. Many of the responses were aimed at what could have been done by others to improve the course such as

- Access to resources
- Have better quality computers
- if i won the lottery i would buy new computers for our centre!
- more handouts
- more tutorials(*sic.*) to show you how things are done
- Text books and good quality computers

For those students who did answer the question regarding what they could have done, here are their responses.

- I would of loved to go into more detail about how a computer works and operates.
- Keep up to date. don't put off what you should do now.
- More Practice on the computer to know what different tools there is for further use
- Practice the if functions
- Take more notes so that not to have to ask questions about things that were already taught to me.
- to be able to learn in more detail if possible
- Try and find extra time at home to go through course work
- try to improve my own computer abilities. Perhaps suggest this type of larning(*sic.*) could be helpful in tudors(*sic.*) were willing
- use/experiment with pc/toolbars more often
- Wish had come sooner to digital age. Time and patience.

## **7.5 Results Conclusions**

### **7.5.1 VARK Results**

- As the largest grouping of learners were in the under 25 category it is interesting to note that Read/Writing mode was the most popular grouping, with kinaesthetic being the lowest grouping, but all kinaesthetic preferences were displayed by Males.

- More males showed Multimodal preferences with 63% of Multimodal learners being male.
- 29% of all learners with Single mode showed Read/Write preferences. This conforms to research by Sanky 2003 (BRUNTON ET AL, 2006) that only between 20 and 30 percent of children at school going age display auditory preferences.
- In the same report Tierney and Bruton (2005) are cited as stating that “business students were predominantly Read/Write when cognitive modalities were examined” (BRUNTON ET AL, 2006)
- Within the under 35 grouping the predominant preference is Read/Write, while in the Over 35 group Multimodal Auditory and Read/Write is the predominant preference. This lead to a conclusion that those in the over 35 age group have honed their skills to the workplace and to previous learning experiences, where visual presentations would not have been utilised much.

#### 7.5.2 Interview Conclusions

The conclusion from the two interviews can be summarised as follows:

- The interviews showed that while both tutors were definitely Digital Immigrant, they both believed that they had managed to defect across the Digital Immigrant/Digital Native order. They were both fluent in ICT.
- Both tutors observed that young learners Digital Native learn differently from older learners Digital Immigrants.
- They both changed their approach to teaching a class of younger learners and a class of older learners.
- Young learners Digital Natives like to move fast and learn only what they need to know.
- The use of game play was limited.
- Limited use of e-learning tools.

### 7.5.3 Digital Native/Digital Immigrant Survey Conclusions

- Based just simply on the age of the respondents 47.6% were Digital Natives as being born in the 1980s.
- The responses received show definite cross over from Digital Immigrant to Digital Native
- The responses also showed cross over form Digital Native tendencies to the Digital Immigrant tendencies.
- From the results on the Digital Immigrant/ Digital Native the results are clear for the under 25s that they are digitally natively inclined
- Those learners in the 55-65 are extremely digitally immigrantly inclined. But with exceptions
- The issue arises in the middle age groups where there is a definite blurring of the lines, those over 35s who have seamlessly crossed the divide. For a generation of instant always on people only 23.8% would do an upload instantly to facebook of a celebrity or event. This is well below the 47.6% Digital Natives by age.
- Only 4.8% of all respondents have had access to a computer all their lives
- Nobody had internet access all their lives., with only 14.3% having access since childhood, primary school
- Only 9.5% learners stated that a day with mobile and internet would be a nightmare, hardly a true Digital Native response when there are in fact over 47% by age
- Smartphone were the purchase of choice when it came to technology

#### 7.5.4 If Statement Survey

- 50% said that they had used e-learning tools before and of those 85.75 reported a positive experience.
- When completing the exercise in their preferred VARK mode and another VARK Mode, 50% stated that that there noticed no difference in which mode was most beneficial to receive the information.
- 42.1% stated that they preferred to work on their own with only 21.1% preferring to have a tutor present.
- 42% responded that their best mode to learn was Read/Write, while 37% found Visual the most helpful and 21% believed Aural to be the most helpful
- On the VARK Survey results the following score were achieved 48% for Read/Write, 22% Visual, 26% Aural and Kinaesthetic at 4%
- 68.4% of those learners surveyed said that they would use more-learning tools in the future if they were available, while a staggering 26.3% didn't know

## 8 CONCLUSION

### 8.1 *Introduction*

This study proposed the following primary research question - what is the effect of learning styles and e-learning tools on the training of ICT to Digital Immigrants in lifelong learning.

After analysing the research from this study the following three findings became obvious;

- The distance between Digital Natives who were fluent and Digital Immigrants who were fluent was quite narrow.
- Being taught in preferred learning styles doesn't seem to facilitate learners to learn in a more productive way
- Most adult learners preferred to have access to e-learning tools but mainly as a back up tool to regular tutor class contact.

This chapter reviews the dissertation and the research that was undertaken to produce this document. Future research areas are also discussed in this chapter, because even though Education has been around for many years the research to Adult Education and lifelong learning in Ireland is still at its infancy stage.

### 8.2 *Research Definition & Research Overview*

The primary area of research for this project was on learning styles, e-learning tools and the effect that both of these had on the teaching of ICT to Digital Natives in lifelong learning.

The secondary research was divided into five parts, firstly a section to ascertain the learning styles of learners, secondly interviews with stake holders, the third part looked at the fluency of digital native and digital immigrants, the forth part of the research was to provide learners with an e-learning tool based on the 4 VARK modes, and finally to receive feedback from learners on their experiences.

### ***8.3 Contributions to the Body of Knowledge***

The project aims to contribute to the body of knowledge by;

- Providing an overview of learning styles with particular preference to digital Immigrant Adults involved in lifelong learning.
- To provide insight into the Digital Immigrant/ Digital Native paradigm and the use of ICT in lifelong learning.

### ***8.4 Experimentation, Evaluation and Limitation***

- i. The study involved two classes of learners one from PLC and one from VTOS but not all the students were involved.
- ii. Only two centres were used both of which the research had direct links with.
- iii. The researcher was a tutor in both centres at the time of collecting the data.
- iv. Unavailability of some learners who had completed the first questionnaire.
- v. The use of only one short period of time to collect data implied that only a small sample of learners and a small sample of centres could be used.
- vi. The sampling method of just asking for volunteers in the classes was intentional, but could have been expanded to include all students in relevant classes. The data gathered could not therefore be said to be representative of VTOS or PLC.
- vii. The use of a singular aspect of spreadsheet methods ruled out a vast majority of learners in VTOS and some of the learners in PLC. Many learners don't study this subject.
- viii. The fact that learners partaking in the surveys were attending classes in spreadsheet methods, implied that they were more driven towards IT, and had an understanding of IT before the course began,
- ix. The current lack of proper Computer systems and broadband infrastructure in Education

## **8.5 Future Work & Research**

There are many areas of this project which could lead to further work and research;

- Expand the data set to incorporate more VTOS and PLC centres in Kildare VEC's remit and possibly expand across the country.
- Expand the e-learning tool to encompass the whole of the Spreadsheet methods module instead of one small part.
- Test the uses of e-learning styles with more students in the VTOS centres and PLC centres in Co. Kildare.
- Further work is also needed in the area of promoting lifelong learning and Adult Education to policy makers, politicians and the public in general.
- Building of more e-learning tools and training of staff.

## **8.6 Conclusion**

Marc Perensky (2009) coined the phrase Digital Native and Digital Immigrant to explain why teachers in a modern world have difficulty in teaching young students. He stated that the difficulty across from the fact that Digital Immigrants (teachers) were teaching Digital Natives (learners).

Over the course of study for the dissertation it has become very clear to the researcher that the divide is maybe not as huge as once believed. It is a very simple analogy to base some bodies skill set on simply when they were born, is to slightly over simplify the problem. The fact that many of the learners surveyed showed that they had actually managed to defect to the other side so much so that the demarcation had become blurred. Many of the younger learners used less ICT than some of the older learners and in some cases were less fluent.

This could be due to social standing and financial issues, and the fact that many Digital Immigrants have been in the workplace where they may have been forced to adopt ICT or be left behind. All of the learners on VTOS and many on PLCs are either unemployed or just out



of school, so financial issues may also play a major role in the Digital Native/Digital Immigrant narrative.

One of the findings that became very obvious was that very few learners surveyed had the use of ICT and internet from the very beginning. This was due more to the fact, that as a country we are behind in terms of ICT and broadband coverage, slow in terms of broadband speed and overcharged for everything despite the banner of knowledge economy that we proudly fly.

Maybe in Ireland we have not fully met our Digital Natives in our secondary schools and universities just yet. Because of the lack of broadband saturation across Ireland and the costs involved many of young people are not as immersed in technology as we are led to believe. In the research only 4.8% of all respondents claim to have had access to IT all their life, while 52.9% have only had access only in their adult life.

The young people 18-30 year olds are only coming to technology in the last five or six years. Maybe the Digital Natives of today, in the next few years will be made to feel like Digital Immigrants as the new breed of Digital Natives arrive.

## 9 GLOSSARY OF TERMS

### 9.1 Introduction

Below is a list of abbreviations used in this document

VTOS	Vocational Training Opportunities Scheme
FETAC	Further Education and Training Awards Council
VEC	Vocational Educational Committee
NCVA	National Council for Vocational Awards (Replaced by FETAC)
BTEI	Back to Education Initiative
PLC	Post Leaving Certificate Course
NFQ	National Framework of Qualifications
V	Visual mode, part of Fleming's VARK
A	Aural mode, part of Fleming's VARK
R	Read Write mode, part of Fleming's VARK
K	Kinaesthetic mode, part of Fleming's VARK

### 9.2 Bytes, Bits and Bobs - Glossary of Terms for Digital Immigrants

**Bit** is a single digit in the Binary numbering system which uses 0,1 to represent numbers and characters, this is representative of how computers communicate. The term Binary digit gives the BIT term. It is the smallest unit of computerised data

**Blog** is a discussion or information site published on the World Wide Web consisting of discrete entries ("posts") typically displayed in reverse chronological order so the most recent post appears first. They can contain commentary and links to other websites and images and video. One example of a blog is Twitter

**Byte** is a sequence of 8 BITS together. This is how storage, file size and speeds are measured in the computer world. More commonly we see KB KiloByte, MB **MegaByte** or Meg, GB **GigaByte** or Gig. A Kilo byte is 1024 Byte, A MegaByte is 1024 KB, and a GigaByte is 1024 MB.

**Broadband** The term broadband refers to a telecommunications signal or device of greater bandwidth and is therefore faster than what went before. It is used to refer to the connection link from a computer to the internet. In Ireland at present it is commonly available at speeds of 3Meg and 8 Meg

**Chat rooms** are websites or part of a website which allows users to communicate by text in real time with many others.

**Cyberspace** is phrase made popular by science fiction writer William Gibson in his novel Neuromancer where he described "a consensual hallucination experienced daily by billions ... A graphic representation of data abstracted from banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data." The word refers to all of the network connections and information that create the virtual space of the Internet.

**Digital Immigrant** is a technology user, usually over the age of 30, who was not born into the digital world. Digital immigrants use technology, but often attempt to bring this use into a framework they find comfort in; for example, they might print material accessed on the Internet before reading it. The phrase was coined by Mark Prensky

**Digital Literacy** is the ability to accurately locate, understand, analyze, and evaluate information using digital tools.

**Digital Native** is a technology user under the age of 30, who was born into the digital world and is accustomed to receiving information very quickly. Digital natives are able to multi-task, and they usually prefer to see graphics before text. They tend to be more comfortable working in a hyperlinked environment and when they receive frequent rewards or feedback. The phrase was coined by Mark Prensky

**Distance Learning** is a type of education in which students work on their own at home or at the office and communicate with course instructors and other students through email, electronic forums.

**Download** is the process of saving a file onto a computer from another source, like the Internet. People often download files, installation software, sounds, movie clips, text files, or news streams, onto their computer for viewing or listening.

**Email (electronic mail)** is the sending of a message over the internet or any communication network. The message normally consists of text but images, files, videos can be attached to the email.

**Hacker** is someone who is very skilled in computer technologies and uses that knowledge to break or test computer systems. There are two distinct types of hackers; Legal Hackers called White Hackers and Illegal Hackers called Black Hackers

**Homepage** is the first page on an Internet Website that provides access to the rest of the website. Or can also refer to the first page that a browser opens up when you start.

**IT (Information Technology)** refers to the technology that is used to gather, store, and disseminate information.

**ICT(Information Communications Technology)** is an all encompassing term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems etc, as well as the various services and applications associated with them that can be used to gather store and disseminate information.

**Microblogging** A form of blogging that limits message length- typically to 140 characters or less. (see Blog)

**MP3 Player** is digital audio player that is used to store, organize, and play audio files. The name “MP3” comes from the most popular format for these audio files. The most recognised example of MP3 players are the ipod range of players. For the Digital Immigrants, think Walkman without the tapes!

**Netbook** is a small-size, lightweight mobile computing device designed to easily access the Internet using built-in wireless capability. Netbooks are also less expensive and less powerful than laptops. A slimmed down version of a Laptop with usually a much smaller screen size as well 10” instead of 15” for laptop

**Online/Offline** have particular meanings in the world of IT. Online usually refers to the fact that the device that one is using is connected to the internet, where as offline means that there is no connection. The term online can also be used to imply that something or piece of information can be found on a website on the internet.

**Password protected content:** Many sites have password-protected webpages. On the other side of the barrier is quality information developed and categorized by professionals. Before you search these pages you must first establish an account. Some sites are free, others charge a fee. Regardless the materials beyond the password barrier can't be reached by search engines and remain invisible until you establish an account, obtain the key, and login to the website. Your online bank account is always password protected.

**Podcasting** is the process of creating audio content that is uploaded to an Internet website. Podcasts can be set so anyone can listen, or they can be password protected to limit access. They can be downloaded and played on a computer, laptop or on a mp3 player.

**Post** this is where a user uploads text, images or video clip which they wish to share online. This is the opposite of downloading

**Search Engine** refers to any of a number of giant databases on the Internet that store data on websites and their corresponding URLs(addresses). Some popular search engines are Google, or Bing.

**Smart Phones** are mobile phones with features that enable it to manage and transmit data as well as voice calls. There are capable of browsing the web, watching movies, playing games. The most common examples at present are the Iphones and Samsung Galaxy S3

**Social Networking Website** is any web-based online community of people who share common interests and/or activities. People create profiles and then form relationships, friends, followers etc with other users at the same website. Examples Facebook and Twitter

**Tablet Device** or computer is a mobile computer normally larger than a mobile phone or smartphone that is integrated into a flat touch screen, where the keyboard appears on the touch sensitive screen. The most widely know tablet device is the iPad deice by Apple.

**URL (uniform resource locator)** in other words the address of a website eg [www.rte.ie](http://www.rte.ie)

**Web 2.0** describes the second generation of websites where the tech literate can read, write, publish and respond to information. Blogs, wikis, podcasts and webinars are the publication tools that make it all happen. While there are nuances to this term, the essential condition is the power for users to create, share, and evaluate digital information.

**Web Browser** are computer programs such as Mozilla Firefox, Internet Explorer, Safari, and Google Chrome that helps you navigate the Web and access text, graphics, hyperlinks, audio, video, and other multimedia. Browsers work by “translating” or “interpreting” hypertext markup language (HTML) – the code embedded in the webpage that tells them how to display the information on the page. Browsers read this code and display the webpage accordingly.

**Wiki** is a website that allows visitors to add, remove, and edit content. A wiki is a collaborative website composed of the perpetual collective work of many authors. Similar to a blog in structure and logic, a wiki allows anyone to edit, delete, or modify content that has been placed on the website using a browser interface, including the work of previous authors. Wiki means “quick quick” in Hawaiian. The most widly known wiki is Wikipedia at [www.wikipedia.org](http://www.wikipedia.org) which is a free online encyclopedia.

**YouTube** is website that allows users to post and/or view video content. It is a video sharing website. The content can be uploaded by individuals, companies or schools so the content is very diverse

## Bibliography

- AL., Bennett et. 2008. The 'digital natives' debate: A critical review of the evidence. *British Journal Of Educational Technology*. **39**(5), pp.775-786.
- ALAN CHAPMAN. 2005. *Kolb Learning Styles*. [online]. [Accessed 6 May 2012]. Available from World Wide Web: <<http://www.businessballs.com/kolblearningstyles.htm>>
- AMARACH. 2009. *Life Online- The Daily Life of Irelands 2 Million Internet Users*. [online]. [Accessed 20 June 2012]. Available from World Wide Web: <<http://www.amarach.com/assets/files/Life%20Online%202009.pdf>>
- AMARCH. 2009. *Life Onine 2009*. [online]. [Accessed 20 June 2012]. Available from World Wide Web: <<http://www.amarach.com/assets/files/Life%20Online%202009.pdf>>
- AONTAS. 2012. *Five priorities for further education and training in a time of reform*. [online]. [Accessed 6 July 2012]. Available from World Wide Web: <<http://www.aontas.com/blog/2012/06/12/five-priorities-for-further-education-and-training/>>
- BENNETT, S & Maton, K. 2010. Beyond the 'digital natives' debate: Towards a more nuanced understanding of students' technology experiences. *Journal of Computer Assisted Learning*. **26**(5), pp.321-331.
- BERGE, Zane. 2002. Active, Interactive and Reflective Eleanring. *The Quaterly Review of Distance Education*. **3**(2), pp.181-190.
- BOATMAN, Kara et Al. 2008. "See How They Learn": The Impact of Faculty and Student Learning Styles on Student Performance in Introductory Economics. *American Economist*. **52**(1).
- BRITAIN, S. & Liber, O. 2004. *A Framework for the Pedagogical Evaluation of eLearning Environments*. Bolton.
- BRUNTON ET AL. 2006. *Transistion to Third Level Education: First Year Induction Week Research*. Tralee.
- CASSIDY, Simon. 2004. Learning Styles: An overview of theories, models and measures. *Educational Pyschology*. **24**(4).
- CLARK, RC, & Mayer,RE. 2003. *ELearning and the science of instruction; Proven guidelines for consumers and designers of multimedia learning*. San Francisco: Pfeiffer.
- CLARKE, A and Luger, E. 2012. *The Big Inquiry, ICT and E-learning*. [online]. [Accessed 2 July 2012]. Available from World Wide Web: <<http://www.niace.org.uk/lifelonglearninginquiry/docs/ICT%20and%20e-learning.pdf>>
- COMREG. 2012. *ComReg Quaterly Report*. [online]. [Accessed 8 July 2012]. Available from World Wide Web: <[http://www.comreg.ie/\\_fileupload/publications/PR14062012.pdf](http://www.comreg.ie/_fileupload/publications/PR14062012.pdf)>

COMSCORE. 2010. *The 2010 Europe Digital Year in Review*. [online]. [Accessed 7 July 2012]. Available from World Wide Web:  
<[http://www.comscore.com/Press\\_Events/Presentations\\_Whitepapers/2011/2010\\_Europe\\_Digital\\_Year\\_in\\_Review](http://www.comscore.com/Press_Events/Presentations_Whitepapers/2011/2010_Europe_Digital_Year_in_Review)>

DEPARTMENT OF EDUCATION AND SCIENCE. 1998. *Adult Education in an Era of Lifelong Learning, Green Paper on Adult Education*. Dublin.

DEPARTMENT OF EDUCATION AND SCIENCE. 2002. *Learning for Life, White Paper on Education*. Dublin.

DEPARTMENT OF EDUCATION AND SCIENCE. 2003. *VTOS FAQ*. [online]. [Accessed 20 Dec 2011]. Available from World Wide Web:  
<[http://www.vtos.ie/main/modules.php?categories=About+VTOS&id\\_cat=1&myfaq=yes&name=FAQ](http://www.vtos.ie/main/modules.php?categories=About+VTOS&id_cat=1&myfaq=yes&name=FAQ)>

DEPARTMENT OF EDUCATION AND SCIENCE. 2007. *Se Si Gender in Irish Education*. Dublin.

DEPT OF JOBS, ENTERPRISE AND INNOVATION. 2010. *Minister Haughey launches National Skills Strategy Implementation Statement*. [online]. [Accessed 9 June 2012]. Available from World Wide Web: <<http://www.djei.ie/press/2010/20100320.htm>>

DUFFY, Marian (President Aontas). 2011. *Aontas Annual Report and Financial Statements 2011*. Dublin.

EUROPEAN MINISTERS FOR VOCATIONAL EDUCATION AND TRAINING. 2010. *Bruges Communiqué on Enhanced European Co-operation in Vocational Education and Training for the period 2011-2020*. Bruges.

EUROPEAN MINISTERS FOR VOCATIONAL EDUCATION AND TRAINING. 2010b. *Bruges Communiqué on Enhanced European Co-operation in Vocational Education and Training for the period 2011-2020*. Bruges.

EUROSTAT. 2007. *File:Reasons for participation in non-formal education and training, 2007*. [online]. [Accessed 10 July 2012]. Available from World Wide Web:  
<[http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php?title=File:Reasons\\_for\\_participation\\_in\\_non-formal\\_education\\_and\\_training,\\_2007\\_%281%29\\_%28%25%29.png&filetimestamp=2011117131421](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=File:Reasons_for_participation_in_non-formal_education_and_training,_2007_%281%29_%28%25%29.png&filetimestamp=2011117131421)>

EUROSTAT. 2010. *Glossary:Information and communication technology (ICT)*. [online]. [Accessed 6 July 2012]. Available from World Wide Web:  
<[http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Glossary:Information\\_and\\_communication\\_technology\\_%28ICT%29](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Information_and_communication_technology_%28ICT%29)>

EUROSTAT. 2011. *Europe in Figures - Eurostat yearbook*.

- EUROSTAT. 2011. *Lifelong Learning Statistics*. [online]. [Accessed July 2012]. Available from World Wide Web: <[http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Lifelong\\_learning\\_statistics](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Lifelong_learning_statistics)>
- FAS. 2012. *Training*. [online]. [Accessed 9 June 2012]. Available from World Wide Web: <<http://www.fas.ie/en/Training/>>
- FETAC. 2007. *Award Statistics for 2006*. [online]. [Accessed 28 May 2012]. Available from World Wide Web: <<http://www.fetac.ie/fetac/providers/statistics/2006stats.htm>>
- FETAC. 2012. *Award Statistics 2011*. [online]. [Accessed 28 May 2012]. Available from World Wide Web: <<http://www.fetac.ie/fetac/providers/statistics/2011stats.htm>>
- FLEMING, N.D. & Mills, C. 1992. Not Another Inventory, Rather a Catalyst for Reflection. *To Improve the Academy.*, pp.137-155.
- FLEMING, T. 2004. The State of Adult Education. *Journal of Adult and Community Education in Ireland*.
- FLEMING, Neil and Baume, David. *Learning Styles Again: VARKing up the right tree*. [online]. [Accessed 10 February 2012]. Available from World Wide Web: <<http://www.vark-learn.com/documents/educational%20developments.pdf>>
- FLEMING, NEIL. 2012. *VARX Learn*. [online]. [Accessed 4 February 2012]. Available from World Wide Web: <<http://www.vark-learn.com/>>
- FREIRE, Paulo. 1970. *Pedagogy of the Oppressed*. New York: Herder and Herder.
- GIRELLI, SA & Stake J. 1993. Bipolarity in Jungian type theory and the Myers-Briggs Type Indicator. *Journal of Personality Assessment*. **60**(2), pp.290-301.
- GORDON DAMIAN, Bull Gordon. *The Nexus Explored: A Genrealised Model of Learning Styles*. Dublin.
- GREGORC ASSOCIATES INC. 2011. *FAQ on Style*. [online]. [Accessed 14 January 2012]. Available from World Wide Web: <<http://gregorc.com/faq.html>>
- HOLMES, T and Rahe, R. 1967. The Social Readjustment Rating Scale. *Journal of Psychosomatic Research*. **11**(2), pp.213-218.
- HONEY, P & Mumford, A. 1982. *Manual Of Learning Styles*. London: P.Honey.
- IBEC. 2010. *Ireland's Industry - a profile*. Dublin.
- IBEC. 2011. *The ICT Sector: Creating jobs and generating growth. Policy recommendations for the next Govenment*. Dublin.
- INDEPENDENT.IE. 2010(a). *Decade of FAS funding to come under scrutiny*. [online]. [Accessed 9 June 2012]. Available from World Wide Web:



<<http://www.independent.ie/business/irish/decade-of-fas-funding-to-come-under-scrutiny-2083436.html>>

INDEPENDENT.IE. 2010(b). *1,700 FAS certificates withheld*. [online]. [Accessed 9 June 2012]. Available from World Wide Web: <<http://www.independent.ie/national-news/1700-fas-certificates-withheld-2360523.html>>

IPSOS MRBI. 2012. *Social Networking Quarterly Survey May 2012*. [online]. [Accessed 19 June 2012]. Available from World Wide Web: <<http://www.ipsosmrb.com/social-networking-quarterly-survey-may-12.html>>

IRISH GOVERNMENT. 1999. *The Irish National Development Plan (2000 - 2006)*. Dublin.

MANOCHEHR, Dr Naser-Nick. The Influence of Learning Styles on Learners in E-Learning Environments: An Empirical Study. *Cheer*. **18**, pp.10-14.

MARCY, Vanessa. 2001. Adult Learning Styles: How the VARK© Learning Style Inventory Can Be Used to Improve Student Learning. *Perspective on Physician Assistant Education*. **12**(2), pp.117-120.

MCCARTHY, Bernice. 2011. *What is 4MAT?* [online]. [Accessed 15 January 2012]. Available from World Wide Web: <<http://www.aboutlearning.com/what-is-4mat>>

MCLEOD, S.A. 2010. *Kolb- Learning Styles*. [online]. [Accessed 15 January 2012]. Available from World Wide Web: <<http://www.simplypsychology.org/learning-kolb.html>>

MYERS & BRIGGS FOUNDATION. *Type and Learning*. [online]. [Accessed 16 Dec 2011]. Available from World Wide Web: <<http://www.myersbriggs.org/type-use-for-everyday-life/type-and-learning/>>

NALA. 1997. *The main research - OECD International Adult Literacy Survey*. [online]. [Accessed 6 June 2012]. Available from World Wide Web: <<http://www.nala.ie/main-research-oecd-international-adult-literacy-survey>>

NATIONAL QAULIFICATIONS AUTHORITY OF IRELAND. 2009. *Frequently Asked Questions*. [online]. [Accessed 16 April 2012]. Available from World Wide Web: <<http://www.nfq.ie/nfq/en/faq.html#main>>

NICHOLS, Mark. 2003. A Theory for Elearning. *Education Technology and Society*. **6**(2), pp.1-10.

PBS. 2012. *PBS Newshour*. [online]. [Accessed 14 March 2012]. Available from World Wide Web: <<http://www.pbs.org/newshour/generation-next/documentary/index.html>>

PRENSKY, Marc. 2001. Digital Natives, Digital Immigrants. *On the Horizon*. **9**(5).

PRENSKY, Marc. 2001b. Digital Natives, Digital Immigrants, Part II: Do They Really Think Differntly? *On The Horizon*. **9**(6).

- RAMAYAH ET AL. 2011. Factors Influencing the Learning Style Preferences among Business School Students. *Journal of Advanced Social Research*. **1**, pp.229-243.
- SCOIL MHUIRE ENNISTYMON. 2011. *increasing the use of ICT in the classroom and introducing e-learning*. [online]. [Accessed 8 July 2012]. Available from World Wide Web: <<http://thelearningschoolproject.com/index.php/lsp-schools-shared-resources/category/21-scoil-mhuire-ennistymon>>
- SIEMENS, George. 2001. *Categories of eLearning*. [online]. [Accessed 15 January 2012]. Available from World Wide Web: <<http://www.elearnspace.org/Articles/elearningcategories.htm>>
- STASH ET AL. *Adaptation to Learning Styles in E-Learning: Approach Evaluation*. [online]. [Accessed 14 January 2012]. Available from World Wide Web: <<http://eprints.dcs.warwick.ac.uk/157/1/10.1.1.107.8619.pdf>>
- STRAUSS, William & Howe, Neil. 1992. *Generations: The History of America's Future, 1584 to 2069*. Harper Collins.
- TAPSCOTT, D. 1998. *Growing up Digital; the rise of the Net generation*. New York: McGraw-Hill.
- VINCENT A., Ross D.. 2001. Learning Styles Awareness: A Basis for Developing Teaching and Learning Strategies. *Journal of Research on Technology in Education*. **33**(5).
- WINDHAM, C. 2005. The Student's Perspective. In D.G. Oblinger, & J.L. Oblinger(Eds). *Educating the Net Generation*., pp.5.1-5.16.
- WORLD ECONOMIC FORUM(WEF). 2011. *The Global Information Technology Report 2010-2011; Transformations 2.0*. Geneva.
- ZUR, O. & Zur, A. 2011. *On Digital Immigrants and Digital Natives: How the Digital Divide Affects Families, Educational Institutions, and the Workplace*. [online]. [Accessed 6 July 2012]. Available from World Wide Web: <<http://www.zurinstitute.com/di>>

## 10 APPENDICES

### 10.1 Appendix A - VARK Questionnaire

How Do I Learn Best?

Questionnaire version 7.1

Choose the answer which best explains your preference and check the box next to it.

Please check more than one if a single answer does not match your perception. Leave blank any question that does not apply.

You are not sure whether a word should be spelled 'dependent' or 'dependant'. You would:

- ☐ write both words on paper and choose one.
- ☐ think about how each word sounds and choose one.
- ☐ find it in a dictionary.
- ☐ see the words in your mind and choose by the way they look.

A group of tourists wants to learn about the parks or wildlife reserves in your area. You would:

- ☐ take them to a park or wildlife reserve and walk with them.
- ☐ give them a book or pamphlets about the parks or wildlife reserves.
- ☐ show them internet pictures, photographs or picture books.
- ☐ talk about, or arrange a talk for them about parks or wildlife reserves.

You are helping someone who wants to go to your airport, town centre or railway station. You would:

- ☐ tell her the directions.
- ☐ go with her.
- ☐ write down the directions.
- ☐ draw, or give her a map.

I like websites that have:

- ☐ things I can click on, shift or try.
- ☐ interesting written descriptions, lists and explanations.
- ☐ audio channels where I can hear music, radio programs or interviews.
- ☐ interesting design and visual features.

You want to learn a new program, skill or game on a computer. You would:

- ☐ follow the diagrams in the book that came with it.
- ☐ talk with people who know about the program.
- ☐ use the controls or keyboard.
- ☐ read the written instructions that came with the program.

You have to make an important speech at a conference or special occasion. You would:

- ☐ gather many examples and stories to make the talk real and practical.
- ☐ write out your speech and learn from reading it over several times.
- ☐ write a few key words and practice saying your speech over and over.
- ☐ make diagrams or get graphs to help explain things.

You have finished a competition or test and would like some feedback. You would like to have feedback:

- ☐ using examples from what you have done.
- ☐ from somebody who talks it through with you.
- ☐ using a written description of your results.
- ☐ using graphs showing what you had achieved.

You are using a book, CD or website to learn how to take photos with your new digital camera. You would like to have:

- ☐ a chance to ask questions and talk about the camera and its features.
- ☐ many examples of good and poor photos and how to improve them.
- ☐ clear written instructions with lists and bullet points about what to do.
- ☐ diagrams showing the camera and what each part does.

You are planning a holiday for a group. You want some feedback from them about the plan. You would:

- ☐ give them a copy of the printed itinerary.
- ☐ phone, text or email them.
- ☐ describe some of the highlights.
- ☐ use a map or website to show them the places.

Do you prefer a teacher or a presenter who uses:

- ☐ diagrams, charts or graphs.
- ☐ question and answer, talk, group discussion, or guest speakers.
- ☐ demonstrations, models or practical sessions.
- ☐ handouts, books, or readings.

You are going to choose food at a restaurant or cafe. You would:

- ☐ look at what others are eating or look at pictures of each dish.
- ☐ choose from the descriptions in the menu.
- ☐ choose something that you have had there before.
- ☐ listen to the waiter or ask friends to recommend choices.

Other than price, what would most influence your decision to buy a new non-fiction book?

- ☐ A friend talks about it and recommends it.
- ☐ The way it looks is appealing.
- ☐ Quickly reading parts of it.
- ☐ It has real-life stories, experiences and examples.

You have a problem with your heart. You would prefer that the doctor:

- ☐ gave you something to read to explain what was wrong.
- ☐ described what was wrong.
- ☐ used a plastic model to show what was wrong.
- ☐ showed you a diagram of what was wrong.

You are going to cook something as a special treat for your family. You would:

- ☐ use a cookbook where you know there is a good recipe.
- ☐ cook something you know without the need for instructions.
- ☐ ask friends for suggestions.
- ☐ look through the cookbook for ideas from the pictures.

You are about to purchase a digital camera or mobile phone. Other than price, what would most influence your decision?

- ☐ Trying or testing it
- ☐ Reading the details about its features.
- ☐ It is a modern design and looks good.
- ☐ The salesperson telling me about its features.

Remember a time when you learned how to do something new. Try to avoid choosing a physical skill, eg. riding a bike. You learned best by:

- ☐ written instructions – e.g. a manual or textbook.
- ☐ listening to somebody explaining it and asking questions.
- ☐ diagrams and charts - visual clues.
- ☐ watching a demonstration.

## ***10.2 Appendix B - VARK Copyright***

Thank you for seeking permission to use VARK. We rely on the honesty of people to act in a professional way when using our copyright and trademarked materials. Many don't know that trainers, businesses, government agencies and professional sports groups must be licensed to use them. VARK is free only for use in universities, colleges and high schools and is not available free for private consultants working in those environments. ***You may not place VARK copyright materials on any website or intranet.***

You are welcome to use the VARK materials by linking to our online website, or in paper format, for your research, providing suitable acknowledgement is made. This is the acknowledgement we prefer:

© Copyright Version 7.1 (2011) held by Neil D. Fleming, Christchurch, New Zealand.

### **Education Users**

We can gather your data for you. Our VARK Subscription Service does not need any installation on your system. We capture the VARK scores for your class or classes or for your whole institution. You manage the site and have access to the analyzed results that can be downloaded for your use. The Subscription Service is demonstrated on our website. The cost for six months is approximately \$US95.

Also available is a "*pinged*" profile that can be accessed after completing the VARK questionnaire. You or your students will immediately receive, on their browser a PDF file customized to their VARK scores with study strategies as well (Helpsheets).

If you are using VARK for research, please note that we have two scoring systems and one is designed specifically for research. The Research spreadsheet is based on standard deviations and is available on application. Provide an explanation of your research and also undertake to provide a copy of your finished paper. The spreadsheet uses a different algorithm from the online version. You should also read our research page for advice about using VARK for research to avoid some of the common errors that researchers make.

The advice is at these addresses:

<http://www.vark-learn.com/english/page.asp?p=whatsnew>

[www.vark-learn.com/english/page.asp?p=advice](http://www.vark-learn.com/english/page.asp?p=advice).

### **Business Users**

Please go to our our new VARK Business site at: [www.business.vark-learn.com](http://www.business.vark-learn.com)  
for information and services for your business.

### **Downloads**

You may find the VARK books helpful. They are all available as downloads. The latest book is, "*Have your VARKed your Business?*" It applies VARK principles to business environments. There is a book that teachers and trainers use for widening their repertoire of strategies; "*55 Strategies* ." It has 55 practical ideas to use in your next training session. VARK principles are being applied to coaching elite athletes in our book titled "*Sports Coaching and Learning*" available as a download or as a print book.

Note: The download books are sent immediately payment is made so don't shut down your computer until the book arrives as a PDF on your browser.

To purchase any of these resources (above) you can use a personal check/cheque, a Purchase Order or buy from our secure website with a credit card.

Best wishes for your work.

Neil Fleming  
Designer of the VARK Questionnaire  
50 Idris Road, Christchurch 8052  
New Zealand  
[www.vark-learn.com](http://www.vark-learn.com)  
phone: (64) 3 3517798  
fax: (64) 3 3519939



### ***10.3 Appendix C Digital Native /Digital Immigrant Questionnaire***

Welcome

Hi and thanks for taking the time to fill in this questionnaire.

This Questionnaire is to see if you are can be described as a digital immigrant or a digital native, in order words have you grown up with IT or have you come to it in your later life, and also to investigate how much you use computers in your day to day life.

The easy questions

Just some easy questions to get you started.

1. What is your name?

2. What is your gender?

- ☐ Female
- ☐ Male

3. Which category below includes your age?

- ☐ Under 25
- ☐ 25 - 35
- ☐ 36 - 45
- ☐ 46 - 55
- ☐ 56 - 65
- ☐ Over 65

Now onto the real questions....

Please answer all questions but you may only choose one answer.

4. You are watching the News on TV and one of the items is of special interest to you, how would you find out more about it?

- ☐ Immediately Google it on your smart phone
- ☐ Google it on your home computer later on
- ☐ Read later in an on-line paper
- ☐ Read more tomorrow in the paper

5. You are at an event and a well known celebrity is also attending, which of these options would you choose?

- ☐ Take a photo and upload to facebook or tweet immediately while the event is still ongoing
- ☐ Take a photo and show your friends later
- ☐ Take a photo and email your friend later
- ☐ Enjoy the moment and tell your friends later

6. If you are traveling to a new location that you have not traveled to before, how would you prepare for the trip?

- ☐ Use Google Earth with Street View
- ☐ Use Google Maps (static map)
- ☐ Use a route planner application
- ☐ Ask a friend or use a map

7. You want to get a new recipe for a meal or you are unsure as how to cook the meal, which of the following best describes what you would do?

- ☐ Use Youtube
- ☐ Google the recipe online
- ☐ Google for a recipe site/ use a recipe you saw in a magazine or paper
- ☐ Look up a recipe book

8. Its Holiday Booking time, which of the following options best describes your approach to booking a holiday?

- ☐ Visit the hotel website , use trip advisor or other report sites and then book directly
- ☐ Get a brochure, look at the website for the hotel, then book directly
- ☐ Do a Google search, and then go to a travel agent and make a booking with them
- ☐ Get a brochure and then go to a travel agent and let them take care of all the details

9. You need to check your bank balance what do you do?

- ☐ Login online
- ☐ Use a phone bank system
- ☐ Use a bank link or ATM
- ☐ Wait and go to the bank when it is open

10. An urgent email is needed to be sent, how would you cope with this?

- ☐ Send the email and attachments
- ☐ Send the email and attachments and follow up with a call to say that you sent it
- ☐ Don't email them, facebook or tweet them instead
- ☐ Get somebody else to send the email for you

11. How long have you had access to a computer?

- ☐ All of your life
- ☐ Since childhood (under 12 or primary school)
- ☐ In my teens (over 12 / secondary school)
- ☐ As an adult (work life/ college)

12. How long have you had access to the internet?

- ☐ All of your life
- ☐ Since childhood
- ☐ In my teens
- ☐ As an adult

13. You are at work and you have to photocopy double sided, do you

- ☐ Do it yourself
- ☐ Get somebody else to do it for you
- ☐ Get somebody to show you how to do it
- ☐ Read the manual

14. You are about to buy a book, do you
- ☐ Order it online and wait for it to be delivered
  - ☐ Go to your local bookstore and buy the printed book
  - ☐ Download it instantly to your ereader
  - ☐ Wait for the movie
15. Have you ever used a blog, wiki, social networking site or microblogging services
- ☐ Yes, all of the above
  - ☐ Yes, some of the above
  - ☐ No, but I am aware of them
  - ☐ No.
16. If there was no mobile phone or internet for a day due to power problems, how would a day without technology feel?
- ☐ Normal/wouldn't miss the IT
  - ☐ Okay/ Do without but get through
  - ☐ Stressful
  - ☐ Nightmare
17. If you are sending a text message which of the following best describes what you type?
- ☐ All Txt message type eg cul8r
  - ☐ a mix of txt and full spelling
  - ☐ full spelling only
  - ☐ just ring them
18. You need to remind yourself of an important appointment, what do you do?
- ☐ Set a reminder on your phone
  - ☐ Set a reminder on your calendar app and use cloud sharing to add it to all your calendars
  - ☐ Do you write it in your diary and on your phone
  - ☐ Do you just write in in your diary

19. How much do you spend annually (approx) on new technology?

- ☐ less than €50.00
- ☐ €50 - €100
- ☐ €101 - €250
- ☐ €251 - €500
- ☐ Over €500

20. What was the latest piece of technology that you bought?

- ☐ Smartphone
- ☐ Mobile Phone
- ☐ Digital Camera
- ☐ Sat Nav System
- ☐ Computer/ Laptop/ Tablet Device
- ☐ Kitchen Appliance

Other (please specify)

21. Have you ever bought a product on line?

- ☐ No Never
- ☐ No Never, have no credit card
- ☐ Yes once or twice
- ☐ Yes regularly

22. Last Question. Do you play computer games?

- ☐ Yes but only solitaire on my pc
- ☐ Yes Games on my PS3 or Xbox or Wii
- ☐ Yes on my phone
- ☐ No Never.

The End.....

Once again thank you very much for taking the time to complete this questionnaire.

## ***10.4 Appendix D The Experiment Post Questionnaire***

Welcome to the IF questionnaire

Welcome back to SurveyMonkey and the last of the questionnaires. These few questions are based on your experience of the Learning styles IF Website which you have completed.

Just to check you that you have taken 2 of the modes in V A R K pages and have completed all the ifs on each page - Simple, Nested and Compound AND/OR.

If you have completed all the exercises above carry on, if not please revisit the If website. Thanks a Million. Stephen

1. Please enter your name

2. Please select your gender

- ☐ Male
- ☐ Female

3. Which Age category are you in?

- ☐ Under 25
- ☐ 25 - 35
- ☐ 36 - 45
- ☐ 46 - 55
- ☐ 56 - 65
- ☐ Over 65

Previous E-Learning Experience

Here are some questions to set some background with regard to the use of e learning tools

4. Have you previously used any elearning tools in work, at home or on courses. These could have been online or on CD/DVD.

- ☐ YES
- ☐ NO
- ☐ Don't Know

Yes

5. If your last answer was YES (Q4) then what was the course content. (briefly)

6. Again if you answered YES how would you describe your experience.

7. Again If Yes was the experience positive?

<input checked="" type="radio"/> Mostly Yes	<input type="radio"/> Mixed	<input type="radio"/> Mostly No
---	-----------------------------	---------------------------------

No

8. If you answered NO to question 4, why have you not used elearning tools before?

- ☐ There was no opportunity to use e learning tools
- ☐ There were tools but I avoided them
- ☐ Wouldn't know what an e learning tool was
- ☐ Saw them demonstrated but didn't use them
- ☐ Other reason (please specify)

9. Please rate the following

	Very Poor	Poor	Average	Good	Very Good
My IT Knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My use of IT at home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My use of IT at work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My companies use of IT (previous career)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My companies training of IT(previous career)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## The Mode Choice

On the website you were asked to select your main mode and a mode of your choice. Here are some questions on those choices.


10. What is your main VARK Mode? If you are multimodal please select the two modes.

- ☐ V - Visual
- ☐ A - Aural
- ☐ R - Read/Write
- ☐ K - Kinaesthetic

11. Which Other Mode did you choose?

- ☐ V - Visual
- ☐ A - Aural
- ☐ R - Read/Write
- ☐ K - Kinaesthetic

Why?

A text input field with a scroll bar and a 'Why?' label. The input field is empty and has a light gray border. The scroll bar is on the right side of the input field.

## Your Non Main Mode

Just a few questions regarding your experience on the tutorial in your non main mode

12. Please rate your experience of this tutorial. That is in your NON MAIN Preference.

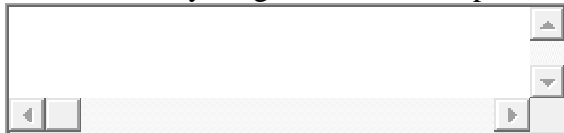
- ☐ Very Easy to Follow
- ☐ Easy to follow
- ☐ OK
- ☐ Slightly difficult to follow
- ☐ Very Difficult to follow

13. Please explain your decision in the previous question?

A text input field with a scroll bar. The input field is empty and has a light gray border. The scroll bar is on the right side of the input field.



14. What if anything would have helped make your learning experience better?



15. What if anything hindered your learning experience?



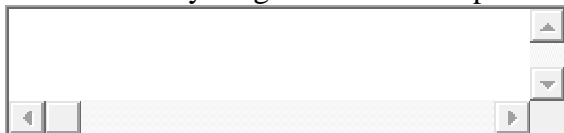
Your Main Mode preference

Now there will be a few questions on your main mode preference.

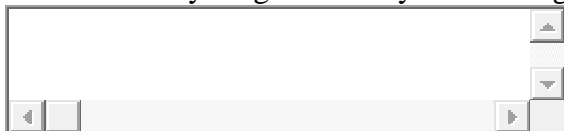
16. Please rate your experience of this tutorial. This tutorial is provided in your MAIN learning Preference.

- ☐ Very Easy to Follow
- ☐ Easy to follow
- ☐ OK
- ☐ Slightly difficult to follow
- ☐ Very Difficult to follow

17. What if anything would have helped make your learning experience better?



18. What if anything hindered your learning experience?



Comparison of different Modes

Just a few questions, to find out about your preferred mode of learning.

19. Which mode of tutorial did you find the most helpful?

- ☐ Visual
- ☐ Aural
- ☐ Read/Write
- ☐ Kinaesthetic

Why did you choose this option(please specify)

20. Please rate your experience of the modes that you selected. (you may leave the modes you didn't use blank)

	Not Very Helpful	Not Helpful	OK	Helpful	Very Helpful
The Visual Presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Aural Presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Read/Write Notes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> 1
Kinaesthetic Do Exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Audio You Tube Clips (on the Aural page)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Last set of Questions

Just a few more questions!

21. How do you best work in class?

- ☐ by Myself
- ☐ in Twos
- ☐ in Small groups
- ☐ with a tutor present

22. Would you preferred to have a tutor explaining the lessons to you?

- ☒ Yes
- ☐ No

Comment

23. Would you have preferred more support from a tutor in order to use the website?

- ☐ Yes  
☐ No

24. Would you have preferred a tutor to explain the content of the pages to you?

- ☐ Yes  
☐ No

Comment

25. Can you rate your experience of using IT on your present course.

	Very Poor	Poor	OK	Good	Excellent
Quality of Computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of IT support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge of IT Tutors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of Computers for out of class work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of Tutors out of class times	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. Would You use more e learning tools in the future if they were available to you?

- ☐ Yes  
☐ No  
☐ Don't Know

Please explain your answer (Briefly)

27. Final Question: What ONE thing would you do to improve your PC learning experience on your course

Thank You

Once again a big Thank You for your help and support with these questionnaires and websites. Hope you have a great summer and for those back in September See you then. For those who have completed their course the very best wishes for the future.

Thank You

### ***10.5 Appendix E- Tutor 1's Interview***

Full Transcript of Interview with Tutor 1 – Tutor 1

Here is the transcription of the full interview. The full interview lasted 29:05 minutes

**1. If I can just ask you your name first of all?**

Tutor 1

**Thanks Tutor 1 for taking the time.**

Your welcome.

**A couple of questions we will go through them. The questions are short enough if you feel like expanding on the answers feel free. Em, if you want to keep them brief enough that's ok too. It just saves my typing afterwards.**

**2. How long have you been teaching Tutor 1?**

10 years

**(Stephen) 10 years ok**

**3. What are your main areas of teaching?**

It's quite varied actually. I teach some social science subjects like psychology and behaviour studies. I also teach some business subjects and some IT subjects.

**4. Ok em, Are these the same as your qualifications?**

The social science subjects would be and I do have a qualification in work place management, but I don't have any in IT.

**5. Ok em and obviously If not how did you end up teaching ICT briefly?**

Em! I have an interest and em a certain amount of knowledge in the use of common applications in IT that together with my own teaching experience put me in a position that I could be asked to do it.

**6. Ok em, Are you aware of the term Digital Native and Digital Immigrant and could you briefly explain them?**

I believe a Digital Native to be someone that has grown up with the kind of technology that we using now and a Digital Immigrant to be someone who has learnt perhaps as an adult to use that technology.

**7. And would you, in which cap would you place yourself would you be a Digital Immigrant or would you perceive yourself to be a Digital Native?**

Although I don't feel like an Immigrant I think I would have to be classified as an Immigrant because when I was growing up the kind of technology I used for everything now didn't exist.

**8. And why do you say you feel you would have to be put into the Digital Native or Digital Immigrant area?**

Because I didn't grow up with this type of technology.

**9. But you feel you've bridged the gap?**

I think I have.

(Stephen) Em, so the next few questions are going to be about your class and your students.

Ok.

**10. Em! What range of ages do you have in your class?**

My youngest students would be twenty one but the age ranges vary then right up until perhaps the early sixties. The majority of students would be in their eh! aged between twenty five and forty I suppose.

**Em! Look at the ICT IT subjects mainly not the other subjects that we are going to base some of these questions.**

**11. Em! How would you rate the levels of your classes would you say they're Beginners, Intermediate, Advanced or Expert?**

They are certainly not expert because I wouldn't have to skills to take an expert class. Em! They would be classified as beginners although many have much more knowledge than they believe themselves to have before they began classes.

**12. Would you like to just expand on that a little bit?**

Well for instance in doing introductory or basic classes in em! Information technology many students would say they can't they don't know how, yet they're using the internet they're using social networking eh they're using email as standard communication em and are managing a windows, certainly a windows environment quiet easily so it's a matter of working with them through course content rather than teaching them basic skills.

**13. Ok em! On the IT subjects, what's your favourite subject to teach? In the IT area, IT and business area?**

I find word processing the easiest to teach. Em! But I prefer working with the internet. I can say absolutely that database is the one that I prefer least.

**(Stephen) Em! So like when you are saying the ECDL, would you prefer not to do database but you would prefer to take on word processing or internet if you are looking at the ECDL modules for example.**

It's easier as a tutor to work with students eh! on a module like word processing or internet and email because they can relate it to things they are doing themselves. When working with something like database students often can't relate it to things they do themselves and perhaps it's not as easy for them to engage with the concepts for that reason. In fairness it maybe because I don't like it very much and don't engage with it that I consider that to be the case.

**14. Ok em! Do you notice any major difference in the way younger students, you say you have students from twenty one upwards how they learn and the way in which older students say in their forties let's say mid to late forties upwards do you notice a way in the young people learn and the way the older people learn?**

Yes I believe the the fact that the whole IT environment requires no teaching for the younger generation. They almost use it automatically without thinking and without being aware that they are practicing any kind of a skill. Whereas the older generation you need to take time to explain em the environment why another window is open, how you close it, how you minimise it, how you get to another application. Younger people seem to be using the whole IT environment without any awareness that they are doing it at all. I doubt if I asked a fifteen year old or a twenty five year old em about how window worked for instances, they would explain it to me in any kind of practical way because they might consider it a silly question because it's just there and because it works and that's just what you do. Or is in last week a local person asked me to teach them basic computers here from home and he's in his early sixties and wanted to look for work and use the internet to look for work and to send and receive emails and he had never turned on a computer in his life before. Said he was approaching the whole thing with a physiological barrier because he didn't like computers and didn't want to have to learn and I found it was necessary to explain the the very introductory steps to why things were happening why a click was a click why a click brought you somewhere else, why a window em opened why a window closed. In other wards what was the point in everything that was going on in front of him, so you know it's but in fairness there are people regardless of their generation who grasp it immediately so I also feel it is something to do with how we learn and what interests us and what engages us.

**15. Em! When it comes to sharing ideas in the class do you notice any differences between the younger people share ideas and the way the older people share ideas? You know if you give an idea out and there is a discussion on it, now it might not necessary be an IT subjects, it could be across the board, but do you find your sharing of ideas different for young people as it is to the way older people share ideas or work through ideas?**

In general, younger people share ideas in smaller groups older people clarify by asking questions and are there and through that process are sharing with the whole group.



Younger people often talk to the person beside them and share an idea in that way. It does not always benefit the whole group it may not even benefit the person they're sharing with because they haven't clarified themselves em so they are not getting the full benefit from their their idea if you like.

**(Stephen) I see that ok.**

**16. Em! Do you find that younger students achieve better in ICT than older students in terms of results?**

Not necessarily

**(Stephen) And do you find that strange?**

I understand it em it's to do with I don't think it's to do with IT, well although they often are quicker to em grasp concepts they're not necessarily looking at the fine print if you like and looking at all the detail they like to just get the job done well if im ask if you're asking me to achieve this they go I've achieved it, they don't necessary look at the detail and the steps towards achieving that goal. So in a practical sense they become much more quickly skilled users, but how they might adapt that knowledge to perhaps other applications or other tasks they may not have all the detail to adapt that knowledge they're just interested in achieving a particular goal and getting there as quickly as possible. Whereas, all the users would like all the detail and try to logically understand why that is happening. Digital Natives if you call them that, the younger generation who have grown up with this technology no more understand why or seem to mind why something works, no more that you and I necessarily know the biologically ins and outs of why we breath we just know we do it and that fine as long as we keep doing it. And the older generation would if you were teaching them eh the biology of the circulatory system or something they would like to know exactly how that works and why that works, I think that's the difference.

**(Stephen) ok em so I suppose the follow on to that.**

**17. Do you find that young students, while they may fly around Google, facebook, twitter actually struggle with ICT concepts?**

I don't think they would struggle if they would if they seem to not mind, I give you an example I thought ECDL once in a school where there were four slots empty in an evening class which they gave to fifth years students so amongst my adult students I had four fifth years five fifth years or something, now those students passed every ECDL exam whilst chatting to each other at the back of the class no problem but I happen to know because one of those students was my son, that many of the things that they had learnt to pass exams they couldn't necessarily apply practically afterwards because I have still been asked questions related to things they passed an exam on after the exam. Ok so em but young people are good at they like to move forward fast and they like to they like to pair everything down to exactly what they need to do.

**(Stephen) ok ok em!**

**18. How, Do you think the teaching of ICT in the classroom or in education has actually kept pace with the changes in IT?**

That's difficult because I probably don't know enough about what the changes are in ICT em in a software environment where I work eh we may struggle a little I suppose its adequate in that we're managing to work with basic software applications that are used in a clerical or business environment only. We don't touch on other areas em other kinds of media we don't look at em we don't look at film photography or video production at all, we don't look at sound, we don't look at many of the other areas where technology is used now. It's limited to a small business or clerical environment I suppose.

**(Stephen) ok.**

**19. If you could teach any ICT relate subject what would you most like to teach?**

Em I like I would like to teach something like web design that looked at marketing em some visual creativity as well as technology.

**(Stephen) ok em yeh em sorry. If you wouldn't mind repeating that because I just got a message coming in there.**

Ok yeah.

Em I like I would like to teach something that used technology eh related to eh web design I think because I like marketing and I like eh visual creativity as well as technology I would like to put all of those three things working together not web authoring though.

**20. Em! If any ICT subject could be taught in the centre either by you or somebody else, which do you think would be the most beneficial to students in helping them move forward or in going forward in life, in business, in college?**

I think something practical em related to maintenance and networking or something in the in visual media which I think has huge advances in now related to film and eh video production.

**21. Em! In your class do you change the way in which you teach younger students and the way you teach older students? If so how?**

I think perhaps I'd change my language I think the issue is communication the communication of concepts and ideas needs to be different em it's difficult for us because we have such mixed classes so you may in fact say something one way and then go on to explain it in a another way using whatever methods can facilitate depending on the group so using as many visuals as possible, using handouts, but the main thing is changing the language because a statement to one person in order to teach them a new skill of them to achieve a task maybe completely meaningless to another person and they may require further demonstration and a slight change of language in order for them to grasp the concept.

**22. Em! Yeah Do you use computer games in your classes?**

Rarely, one of my classes requires em eh text production at a particular level at a particular speed and I would encourage students to use any means possible to familiarise themselves with the keyboard and that can include games.

**23. Em! So you obviously do you see any advantage to using games in your classroom to teach and would that be across the spectrum of ages or would it just be aimed mainly at younger people or older people?**

No, I think it would be across the spectrum, I've had students in my class who have eh been very familiar with online gaming and but wouldn't have been taught formally to type and eh their typing speeds are very high so often it isn't necessary any kind of formal training but just familiarity with the keyboard.

**24. Ok, em Have you used any e-learning tools personally yourself? And if so briefly describe them and the use of them.**

Do you mean using the computer to learn something or using

**(Stephen) using whether it being online or a built in tutorial to follow through a tutorial.**

Ok I em I have used the em ECDL is taught can be taught using em e-learning tools only and without the tutor at all. I have gone through that as a tutor myself as a resource. I can't think of anything else specifically that I've used but, for for research it is used all the time but it's that's not for a specific skill or task but I can't it's hard to imagine now how we would do any kind of research or eh get support or resources for our work or for our learning without IT.

**(Stephen) ok.**

**25. Em! So you mentioned ECDL em obviously you have used that as a new learning tool in class, are there any other tools you have learnt or I suppose even with ECDL how do the students adapt to it?**

Students we've changed our method in the way we teach ECDL recently and it was taught and facilitated by a tutor guiding and teaching students step by step through skills. In the last two years it has been taught using an ATS system which gives step by step instructions on screen. Now if that was to be used alone I think it would not benefit students in the way that having practical exercises and having a tutor is a huge advantage because you can learn and memorise the steps that e-learning tools gives you. I think they are good for practice and good for support, I don't think that they benefit students as much as having guided classes with a a tutor or facilitator.

**(Stephen) ok, em, nearly there, nearly there, with a couple more questions.**

**26. Do you think that em ICT should be taught as a standalone subject which it is in VTOS or should it be integrated in all classes across the centre or integrated into more classes across the centre maybe, maybe a better way of putting it?**

I try to integrate some aspect of IT into all of my classes. I think if we don't do that, I feel because we are surrounded and every aspect of our lives includes this kind of technology I think if we don't do that that we're only often only teaching theory to students. I think it's a huge resource for tutors as well as students as a learning tool em and I'm a little frustrated sometimes by our lack of equipment and our lack of resources because the whole learning experiences could be much richer for the use of em ICT in every subject I think.

**27. Do you have any ideas how this could be achieved in every subject or do you think you would find it easy to achieve that in every subject?**

I think ten years ago, em we were not surrounded especially by multimedia in the way we are now and I I've noticed that particularly younger people em engage with visual media much more quickly than they do em with text or it's certainly as a support to their learning it is a great advantage to them. There are many arguments that it's making people lazy as if they just want to you know see and hear things and then move on to the next thing it does increase the pace, em but I think if managed well and without and not excluding other aspects of learning I think it's of huge advantage. Sorry your question was, how could we do it? How could we do it? I think we should have equipment that allows us to experience things in lots of different ways through each subject. In the same way that you might experience something in reality and you may also read about it, but

to hear it to see it only gives greater depth to the learning and the whole experience I think. How we could do it if someone gave us lots of money and we had lots of great equipment and you know we we use visual media, we used practical hands on, eh interactive tools to enrich the whole experience but at the moment we're not only are we on white board we're on chalk boards sometimes so.

**28. Em Do you use Web 2.0 based tools in your class?**

I don't know what that is really

**(Stephen) interactivity on the web is a very simple way of explaining it.**

Have you got an example or is there an example of,

**(Stephen) well I suppose it leads back to e-learning. Em, The questions was just I suppose the real question should be? Are you aware of what Web 2.0 based tools are?**

Not really

**(Stephen) ok em. Now I know you have sort of answered this question but I was just going to repeat it because it is one of the questions**

**29. Do you think that ICT resources are given that enough ICT resources are given to the Adult education sector and to students in those sectors?**

Absolutely not absolutely not and it's not giving people a full and realistic opportunity to go and engage in the society they live in, in the way they don't probably have the skills and resources leaving us for instance to go out there and compete in the jobs market because the fact that you can use a word processor or the fact that you can send an e-mail isn't enough now. Networking is done through ICT, em em conferencing is done through ICT. All relationships relationships are formed are strong within ICT now or through ICT as there are in the real world and without an awareness of that students being able to type your CV and send it by email isn't enough now. We're we are becoming marginalised, people are who cannot engage immediately with this, will become marginalised because they they're not fully in society they're on the fringes of it and there if if our network is a network of people communicating through ICT then we

have to be able to jump in there and be on an even playing field with everyone else and communicate and engage eh ah on the same level. Otherwise society is moving off and leaving us on the fringes and saying you can send an e-mail isn't enough because there is too much going on there in a network that people are still seeing and really I don't think they are seeing the depths of this network. They're just seeing it as an internet and e-mail connecting still but it's much more than that.

**30. Eh, Finally a wish list if money was no object what two pieces of ICT equipment would you like to see introduced into your classroom? If money was no object?**

Interactive white boards and is this can I can I give students equipment or are we just talking about resources for tutors?

**(Stephen) into your classroom as open as that, whether it be yours, whether it be for the teacher for the class or for the students.**

Interactive white boards and eh and stations, internet stations in each class as to be used as part of a class, so to be able to get to access information. As, as a group becomes engaged with an idea or as we explore an idea and we talk about it and people start to have an interest, often questions arise for them and it would be lovely if we could straight away. I often as a tutor I turn to a computer and I say well let's find out let's see that let's see how that looks let's and I can do it. It would be lovely if we had stations everywhere around the centre where students can do that immediately so that and interactive white boards for tutors.

**(Stephen) Tutor 1, thank you very much for that. That finishes all the questions. Thank you very much for your time.**

Can I change all my answers now?

**(Stephen) can I remember what the questions were.**

## ***10.6 Appendix F Tutor 2's Interview***

Full Transcript of Interview with Tutor 2 – Tutor 2

Here is the transcription of the full interview. The full interview lasted 15 minutes

**(Stephen) Ok em Good afternoon**

Good afternoon

**(Stephen) Tutor 2. Thank you for taking the time to go through these few questions with me. Just for the record I'd like you to start off by stating your name.**

Tutor 2 McKenna

**(Stephen) thanks Tutor 2**

1. Tutor 2, How long have you been teaching?

Three years

**(Stephen) three years ok**

2. And what are your main areas of teaching?

Em, IT. I'm teaching eh yeah normally beginners at computers and em some communications and eh office procedures.

**(Stephen) em and ECDL**

And ECDL

3. Are these the same as your qualifications?

Eh yes well kind of.

**(Stephen) Do you want do you want to elaborate on that?**

Well I do have level five in those subjects and then I did eh the deb, what do you call it IT, a teachers diploma in IT so that's what I have.



- 4. Ok. Em next question wasn't relevant. How did you end up teaching ICT?**
- 5. Are you aware of the term Digital Native and Digital Immigrant and could you briefly explain them or what you understand by them?**

Em I understand by them that em we'd say with different types of learners there are different problems for example with em immigrants into the country there maybe language barriers with older people they may learn more slowly than younger people. They won't be as familiar with computers, so they won't have grown up with them and whatever so different learners have different problems and different needs.

**(Stephen) Ok em I'm just clarifying on a point. Mark Prensky who wrote this coined the term Digital Native, Digital Immigrant. He was looking at the fact that Digital Immigrant or Digital Native was a person who has grown up since the eighties and who has been immersed in technology all the way through their lives and Digital Immigrant was anyone who wasn't born since the nineteen eighties, and has come to technology through the back door. Ok. So that's just the definition of it.**

**(Stephen) Em so in which cap would you would you place yourself in terms would you consider yourself a Digital Immigrant or a Digital Native?**

Em a Digital Immigrant definitely

**(Stephen) and why do you feel that? You sound definite why do you feel that?**

Em because we didn't have the technology when I was growing up, so I was came to technology late later in life I em I didn't grow up with mobile phones or computers in fairness most times we were lucky to have a telly.

**(Stephen) ok em because you have definitely placed yourself as a Digital Immigrant area and you're now teaching ICT, do you feel you have bridged some of the gap?**

Yeah definitely em I suppose because I don't know, because I had such an interest in it when I did discover it that I made sure that I could bridge the gap, that I em was prepared to go and learn but say other people my age group that didn't have the same interest have absolutely no clue.

**(Stephen) em alright ok the next couple of questions are about em your classes and your subjects.**

Alright.

**6. Em What range of ages do you have in your class?**

From twenty two to eighty

**7. And would you rate the levels in your classes Beginners, Intermediate, Advanced or Expert?**

Beginners.

**(Stephen) All the way across all the subjects?**

Em Well yeah well it's supposed to be all for beginners occasionally we get in intermediates and whatever but that are that don't have any qualifications, but usually it's beginners.

**8. Em What 's your favourite subject to teach?**

ECDL

**(Stephen)ECDL and in if you break it down what's your favourite subject of those seven modules?**

Excel.

**(Stephen) Excel yeah ok.**

**9. Em, Do you notice any major difference in the way younger students learn to the way older students learn?**

Find with older students you have to there has to be a lot of repetition that they're more nervous about the computers so they're not really concentrating that brilliantly on the rest of them more thinking I can't do this I can't do this, where a younger person is just going to launch in and try to do it anyway whether they can do it or not so and eh older people probable don't retain the information as well as a younger person would so. That's about the only difference.

**10. Em, When it comes to sharing ideas in a class do you notice any differences between how the younger students share ideas and the older students share ideas?**

Em elaborate there what do you mean, do you mean if they're discussing a subject?

**(Stephen) in a discussion or if they're trying to find by teasing out of the situation if they're discussion it amongst themselves or teasing it do you find that's there any major differences between them, do they all act the same?**

No I don't find there is any major differences between them but then, I suppose it's because you are working in small groups and there is old people and younger people in it so they kind ah, it's usually discussions or whether ever and they and they sort of jell together, and so there not maybe if you had a group of youngsters and a group of elderly people you might see a difference, but when there actually in a group together I don't see any major difference.

**(Stephen) em!**

**11. Do you find that younger students achieve better results in ICT than older students?**

Yeah.

**(Stephen) ok as simple as that.**

**12. Do you find that young students, while they may fly around Google, facebook, twitter etc. actually struggle with some IT ICT concepts?**

Most definitely they're well able to go in and use youtube and they're well able to go in and find information they want from google, but there none of them able to type a letter or use excel or use to set up a database or em they're not really familiar with em file management or that a lot of them can't even create folders eh and basic little things so, but they're able to use youtube.

**13. Em! Do you think in your opinion, has the teaching of ICT kept pace sorry, teaching of ICT in the education actually kept pace with the changes in IT?**

In fairness it's a bit hard to say really in the small in the situation I'm in. I think em don't think the schools judging by the, but the not as a teacher but as a parent looking at the the way the children are coming out of schools. I don't think the children really in schools now are being taught IT the way they should be. Em, I think in our situation we are doing the best

to keep pace with a limited budget and no equipment and whatever so. Yeah I think that yeah the people on the ground are trying to, but there's not enough of investment overall.

**14. Ok em! If you could teach any ICT relate subject ok what would you most like to teach?**

Em, what do you mean? Like pick a eh whether I would like doing web design or would I like doing.

**(Stephen) if there's any particular subject in IT that you like to that you would particularly like to teach.**

Em well I like doing the ECDL. I like the variety of it and that. That we're simply starting with absolutely beginners and there they get a little taste of everything so I do like the ECDL. Yeah I also like teaching the beginners computers. I do like doing just the basic computers with people who have never switched on a computer before, but apart from that no there's isn't one particular one I'd like to do.

**15. Ok, em, If any ICT subject could be taught in the centre ok, either by yourself or somebody else, which do you think would be the most beneficial to students going forward?**

Em! Well I think they all need to have Microsoft word as an absolute minimum because no matter what other subject they do they're going to need that one, so I suppose that's the most important one. Em for the rest it's just a case of what interest like they're not going to pick on a certain one because everyone's interests are different, but I think every single person should have to do Microsoft word at least.

**16. Em, going back to where you teach ok, do you change the way in which you teach younger students and older students? And if so how?**

Well if I'm teaching young students if it's just all younger students I usually em like demonstration really and practice so I just show them once how to do it and give them the opportunity and I usually would then have a further a maybe an exercise for them to practice so that they they're there having to repeat it at home or whatever. But if it older students I try to do a bit more one to one, so I'd hand out the exercise but I'd try to spend a little bit more time with the older students doing the thing together and then repeating it and repeating it and repeating it again so yeah. I do find I have to stay repeating and would have to if something a

little more complicated I would have extra exercises done up for them to eh so they have something to practice with.

**17. Em, Do you use computer games in class?**

Em, some not a lot, but for people that are not familiar with the mouse I would use card games and things like that so they get use to the feel of the mouse and being able to drag and drop and things like that so I'd use computer games that way but apart from that no.

**18. Ok em, you have kind of answered the question I suppose to a point. Do you see any advantage to using games or maybe other games in your class?**

Em! Well that's one of the main advantages to dragging and dropping , I suppose if you were teaching younger people yeah I could see advantages to computer games or whatever but I don't really think there's that much relevance when teaching adults.

**19. Ok em. Have you have you yourself used any e-learning tools personally? And if so briefly describe them and the use of them.**

Em I have used some programmes like teach yourself em God I can't even remember now cause it's a long time since I have use them, but I did used wouldn't say one's em this that I bought that would help with the ECDL and different ones like that em , but it's a good few years since I used it so I can't really remember. I did buy one on ECDL a disk and use that alright and I didn't find it any good so I didn't use it a lot.

**(Stephen) ok em. Have you used any e-learning tools in your class? And If so briefly describe them and the use of them.**

Em I suppose we have used maybe speaking and things so it's eh able to familiarise people with their keyboards and whatever and em apart from that I kind have just done up my own exercises and things like that.

**(Stephen) And the ECDL do you use any e-learning tools for the ECDL**

No.

**(Stephen) you don't use the online systems or anything?**

Well we use the online systems for exams. They do use the online they do use the em dynastic so yeah they do use the yeah but that's more for practice before the exam that's not

actually during the class. For the exams they do it not for and they would use it for practice during the for the exam. But it's usually done by themselves not with me.

**(Stephen) ok em**

**20. Do you think that ICT should be taught as a standalone subject or should it be integrated into all classes in the centre?**

Well I think it needs to be standalone, I think it needs to be both really, if it's just integrated it into other subjects then I don't I think it loses its importance and you say it's put to the back. The other way if it's a standalone subject and it's not included in then it's only the people who are really interested in IT or are confident enough willing to try and maybe people who would need it but don't try it because there're nervous and don't know how to use a computer this, so I think it needs to be really bold. I do think it needs to be standalone subject, but I do think other classes should a certain amount of it included.

**21. Em! Do you have any ideas how this could be achieved? How would if you were given the free run how would you how would you achieve that quality to be integrate into all your classes? Would you have any quick synopsis quick fix it?**

Well I think if there was more computers available to the students so we'd say they'd need to have computers in every class em so that there seen them been used and whatever so it makes them familiar and it takes away the nervousness of about them, so we'd say for example in the art room if they have to go in and looking for images instead of asking somebody else to find the image for them. They should really have to go and find the images themselves if the computer is there and they're shown then they'll come familiar with them and they'll start to do it for themselves.

**(Stephen) ok em.**

**22. Do you do you use any Web 2.0 based sorry Web 2.0 based tools in your class?**

Which are what? I haven't a clue.

**(Stephen) We'll move on then. Em.**

**23. Do you think that enough ICT resources are given to the Adult education sector and to students?**

Absolutely not without a question. There's no way. There're totally underfunded. Em like in our centre in particularly the budget goes to art and it goes to eh all the other subjects and basically what's left then goes to IT.

**(Stephen) ok em.**

**24. Finally, finally last question if money was no object ok what two pieces of ICT equipment would you like to see introduced into your classroom?**

Em well obviously I would like them all to have new computers firstly and em maybe and interactive white board. Em yeah an interactive white board. Em well for them all to have new computers would be the most important thing. Proper decent computers not just em yeah new computers and an interactive white board.

**(Stephen) ok Tutor 2 thank you very much for your time and your honesty. It's been it's been interesting it's and all gone well. It's finished and eh.**